CHAPTER 4 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

This chapter describes the existing environmental conditions found in the project area and potential changes that may result from implementing the proposed project. Resources and related issues associated with the natural, human, and cultural environment were studied and include the following categories:

- Land ownership, jurisdiction, and use
- Water resources
- Biological resources
- Visual resources
- Air quality
- Noise
- Hazardous materials
- Cultural resources
- Social and demographic characteristics
- Environmental justice considerations
- Utilities
- Material sources and waste materials
- Construction water source

Information was collected through review of existing documentation, consultation with various agencies, organizations, and individuals, and field reconnaissance. Agencies and organizations consulted include, among others, various Native American tribes; the Cities of Glendale, Peoria, Phoenix, and Surprise; Maricopa County; U.S. Fish and Wildlife Service; Arizona Game and Fish Department (AGFD); State Historic Preservation Office (SHPO); BOR; and various utility companies. More detailed information on agency and public coordination that occurred as part of this evaluation is included in Chapter 5.

The affected environment for the proposed project is described for the project or study area. The project area is located in Maricopa County, Arizona, within portions of the Cities of Peoria and Phoenix, and also unincorporated lands under the jurisdiction of Maricopa County. The study area for most resources encompasses the land within one-half mile of the proposed project alignment.

Where it has been determined to be effective or appropriate, or where potential adverse impacts are anticipated, mitigation measures have been recommended. The mitigation measures are described in this chapter, as appropriate for each resource. A summary of mitigation measures is listed also at the beginning of this DEA (page 1). The mitigation measures represent the mitigation plan for the proposed project. More detailed mitigation measures may be incorporated throughout the project design process and would be implemented per mutual agreement among the appropriate local, state, and, federal agencies prior to, during, or subsequent to construction and post-construction activities.

4.1 LAND OWNERSHIP AND JURISDICTION, AND LAND USE

4.1.1 Land Ownership and Jurisdiction

Land within the study area consists of public and private lands (see Figure 2-2) within the jurisdiction of the Cities of Phoenix and Peoria and within Maricopa County (see Figure 2-1). Publicly owned lands in the study area consist of State Trust land managed by the ASLD. Approximately 97 percent of the proposed project traverses ASLD land and 3 percent traverses private lands.

4.1.2 Land Use

Existing Conditions

Figure 4-1 illustrates existing land use, and contains percentages of land uses traversed within this area per segment as well as total percentages traversed for the proposed project. Existing land uses consist of a mixture of commercial, residential, recreational, and undeveloped lands within the study area (see Figure 4-1). The study area is composed largely of undeveloped land, with the exceptions of residential and commercial development on land northeast of the Westwing Receiving Station and several intermittent areas of development along the Beardsley Canal. Lake Pleasant is located northwest of the study area. Designated open space within the vicinity of the study area includes the Ben Avery Shooting Range, Thunderbird Park and Adobe Dam Recreation Area, and off-highway vehicle areas within Agua Fria and New Rivers. In addition, several areas south of the preferred alignment are proposed for Sonoran Preserve designation.

Planned Land Uses

Lands in the study area managed by ASLD are expected to be sold (for residential development) or leased (for commercial purposes) with the revenues going to public schools and other State Trust beneficiaries throughout Arizona. Future plans for development within the study area

include residential, commercial, utility, and industrial uses (see Figure 4-2). Commercial uses would be located primarily along the I-17 corridor, Lake Pleasant Parkway, SR 74, and New River Road, as well as within proximity of the Westwing Receiving Station. Most of the land north of SR 74 and east of New River Road is planned for mixed commercial and public development. Most of the land south of SR 74 and east and west of Lake Pleasant Parkway is planned for residential and open space use. A few intermittent areas of proposed industrial development are located primarily in the central portion of the study area along Lake Pleasant Parkway.

Large portions of land within the study area have been informally classified as desert open spaces as reflected in the MAG Desert Open Spaces Plan (MAG 1995). Although this land has been considered informally for designation, purchasing of such land would be required to implement conservation and preservation efforts. Some proposed trail alignments have been identified in or adjacent to dry desert washes and other riparian corridors in the study area. These areas have been classified as "conservation areas" within the MAG Desert Spaces Plan.

4.1.3 Impacts and Mitigation

No-Build Alternative

If the No-Build Alternative is selected, the proposed project and its associated interchanges would not be built. The interim expressway between US 60 and Happy Valley Parkway would remain. Future development of the area is expected to continue and some arterial roads likely would be extended or developed to assist this development. Continued development of the area is expected to occur if the No-Build Alternative is selected, but access throughout the area may be inadequate to support future land use projections, resulting in traffic congestion.

Proposed Project

The proposed project would require the acquisition of approximately 862 acres of new right-of-way. Table 4-1 contains ownership entities traversed by the preferred alignment and the aggregation of right-of-way required. The exact right-of-way required would be calculated once final design is completed.

Table 4-1 Approximate New Right-of-Way Requirements (Acres)				
	State Land	**BLM Land**	**Private Property**	**Total (acres)**
Happy Valley Road to 43rd Avenue (Segments 1 and 2)	742	2	25	769
SR 303L to Carefree Highway (Segment 4)	93	0	0	93
Total Acres	835	2	25	862

Prior to implementation of the project, the ADOT Right-of-Way Group would research warranty deed information to determine the access rights to the existing frontage road along SR 74 and New River Road, if required. Any permits required by federal land agencies would be obtained. At least two weeks prior to construction, the Phoenix Construction District would provide a construction notice to adjacent residents and businesses.

4.1.4 Conclusion

The No-Build Alternative would impact planned land use in the study area due to the lack of access provided to future commercial and residential areas. The proposed project would require right-of-way acquisition. Adverse impacts would be minimized under the proposed project by (1) avoiding right-of-way takings from private properties by maximizing use of State Trust land, (2) maintaining existing access to adjacent properties, and (3) accommodating increased traffic volumes associated with future land development in the study area.

4.2 WATER RESOURCES

4.2.1 Existing Conditions

Floodplains in the study area are depicted in Figure 4-3. Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panels for the project area show that the 100-year floodplain is crossed by the proposed project at Twin Buttes Wash, Caterpillar Tank Wash, Agua Fria River, New River, and Deadman Wash.

The proposed project crosses nine distinct large drainage basins; five are regulated floodplains as identified on current FIRM panels. These are Twin Buttes Wash, Caterpillar Tank Wash, Agua Fria River, New River, and Deadman Wash. Six of the distinct large basins (including Twin Buttes Wash and Caterpillar Tank Wash) are further divided into 29 sub-basins with areas ranging from 0.007 to 5.2 square miles. Additional information on drainage is available in the proposed project's drainage report.

4.2.2 Impacts and Mitigation

No-Build Alternative

If the No-Build Alternative is selected, the proposed project would not be built. In the absence of a major freeway, the development of land and arterials would have an effect on floodplains and drainage. Due to the lack of specific information on site development that could occur, it is difficult to assess potential impacts of the No-Build Alternative in the study area. However, federal and state regulatory requirements would continue to apply to any development proposals and likely would mitigate some potential adverse impacts.

Proposed Project

Floodplains

The proposed project would be designed to minimize floodplain encroachments and ensure that the flood-carrying capacity of the drainages crossing the project area would not be impaired. Construction of the proposed project would not constitute a hazardous or incompatible use of floodplains; would not result in longitudinal or substantial floodplain encroachment; would minimize elevation increases; restore and preserve natural and beneficial floodplain values; and would be consistent with FEMA, ADOT, and Flood Control District of Maricopa County standards regarding highway construction in floodplains.

The proposed project alignment was developed to minimize any lateral encroachment into designated floodplains. The proposed project would include box culverts at Twin Buttes Wash and Caterpillar Tank Wash. Bridges would be constructed at Agua Fria River, New River, and Deadman Wash. New bridges and roadway encroachments into the designated floodplain would be designed to meet both the ADOT criteria for the 50-year frequency event and the FHWA guidelines for the 100-year frequency event.

The FEMA criteria allow water surface elevation increases of 1.0 foot or less in regulated floodways. Project facilities that would cause substantial increases in the established 100-year water surface elevation would require preparation and submittal to FEMA of a Letter of Map Revision (LOMR). Coordination with FEMA will be initiated on all proposed water surface elevation increases.

The SR 303L is classified for design as Drainage Class 1. In addition, open channels that are constructed with the proposed project adjacent to the highway would be designed to preclude

saturation of the roadway pavement structure at a 10-year design frequency. Where overtopping would permit stormwater to break out of ADOT right-of-way, the channel freeboard is a 1-foot minimum.

Where the floodplains are very wide, such as the Agua Fria River, New River, and Deadman Wash, it may be necessary to raise the regulated 100-year water surface elevation more than one foot. The largest increase in elevation would occur at the New River crossing, which has a 4,500-foot± wide floodplain at the proposed crossing. The proposed 908-foot-long bridge would raise the 100-year water surface elevation by 3.74 feet. This is similar in concept to the two 400-foot-long bridges upstream at the SR 74 crossing. Approximately 30 acres of flow easements would be required on Arizona State Trust lands. The Deadman Wash crossing has a 2,100-foot± wide floodplain at the proposed crossing and the proposed 379-foot-long bridge would raise the 100-year water surface elevation by 1.45 feet. Approximately 0.7 acre of flow easements would be required on Arizona State Trust lands. During final design, Conditional LOMRs would be prepared and submitted to FEMA for review, comment, and approval prior to beginning construction. After construction is complete, the final LOMR would be prepared, based on as-built plans, and submitted to FEMA for review, approval, and issuance of revised FEMA FIRM panel(s).

Section 404/402/401 of the Clean Water Act

Fifty-four ephemeral washes, 27 identified by blue-lines on USGS 7.5-minute quadrangle maps, would be crossed by the proposed project. Table D-1 in Appendix D lists these 54 washes. Washes shown on Figure 4-3 are those identified by USGS, and may not include all washes listed in Appendix D. The acreage within these washes that would be crossed by the proposed project was estimated, based on an observation of the ordinary high water mark, using aerial photography (1 inch = 200 foot scale) dated 1999 and 2000. The 54 crossings would require installation of drainage structures and may result in placing fill on a total of about 13.6 acres within the washes. The seven crossings associated with the five major washes having FEMA floodplains account for most of this impact (about 8 acres), with the majority (7.5 acres) at the Agua Fria River crossing. The total fill area at the remaining 47 crossings is about 5.5 acres. Based on these preliminary estimates, the proposed project could potentially impact a total of 13.6 acres within the ephemeral washes and floodplains in the study area.

The project would result in increased stormwater runoff from the additional impervious roadway surfaces. These waters would be collected and conveyed by a storm drain system for discharge into the nearest natural wash. Detention basins would be installed, if necessary, to mitigate any increases in peak runoff rates.

Coordination with the Corps is required to complete the jurisdictional delineation to formally define whether these washes are jurisdictional waters of the United States, identify permit requirements under Sections 401 and 404 of the Clean Water Act, and mitigate potential impacts as the design of the proposed project goes forward. During final design, coordination with the U.S. Army Corps of Engineers would occur to complete the jurisdictional delineation to formally define whether washes are jurisdictional waters of the United States, and identify permit requirements under Sections 401 and 404 of the Clean Water Act. These delineations will be made during the final design of the project and these will be conducted in accordance with the Corps Delineation Manual (Corps 1987). Based on the review of current design concept plans, it is anticipated that the proposed project may require a Corps Individual Section 404 Permit and Section 401 individual certification by Arizona Department of Environmental Quality (ADEQ). In early consultation with the Corps, it was determined that CBCs would be required at Twin Buttes Wash and Caterpillar Tank Wash and bridges are required at Agua Fria River, New River, and Deadman Wash. The crossing of other unnamed drainages would require the installation of CBCs or pipe culverts.

According to ADOT's *Standard Specifications for Road and Bridge Construction*, (2000 Edition), Section 104, "Scope of Work," Subsection 09, "Prevention of Landscape Defacement; Protection of Streams, Lakes, and Reservoirs," ADOT would ensure that, "[t]he contractor would take sufficient precautions, considering various conditions, to prevent pollution to streams, lakes, and reservoirs with fuels, oils, bitumens, calcium chloride, fresh Portland cement, raw sewage, muddy water, chemicals, or other harmful materials. None of these materials would be discharged into any channels leading to such streams, lakes, or reservoirs." and also according to Subsection 09, "[t]he contractor would give special attention to the effect of its operations on the landscape and would take special care to maintain natural surroundings undamaged."

Pollutant Discharge Elimination System/Storm Water Pollution Prevention Plan

On August 22, 2005, the Ninth Circuit Court of Appeals vacated the United States EPA delegation of the Clean Water Act permitting authority to the State of Arizona. The ruling questions the validity and status of permits issued and managed under the Arizona Pollution Discharge Elimination System (AZPDES), including the construction general permit for stormwater discharges and individual AZPDES permits.

Because more than one acre would be disturbed during construction, an AZPDES/National Pollutant Discharge Elimination System permit would be required. The ADOT District Construction Office and the contractor would submit the Notice of Intent and the Notice of

Termination to ADEQ and EPA. The ADOT Roadside Development Section would determine who would prepare the Stormwater Pollution Prevention Plan during final design.

4.2.3 Conclusion

The proposed project would be designed to minimize impacts to floodplains and jurisdictional waters of the United States, and construction of the proposed project would incorporate best management practices, include erosion control measures, consult with FEMA on floodplain encroachments, and comply with all Corps and ADEQ water quality permit terms and conditions to protect water quality in the project area. With the incorporation of these measures, the proposed project would have no substantial impact on water resources.

4.3 BIOLOGICAL RESOURCES

4.3.1 Description of the Physical and Biological Environment

The project area is located in the northern edge of the Basin and Range physiographic province, a northwest-southeast alignment of mountain ranges with broad valleys between (Robichaux 1999). Past geologic structural activity distinguishes this province from the Colorado Plateau province. The structural history has resulted in topographical differences and both have directly influenced the nature and distribution of soils, which have determined the vegetation character (Hendricks 1985 and Robichaux 1999).

The project area includes broad valleys surrounded by gently sloping volcanic hills and ridges. The valleys and bajadas that connect them to the surrounding hills are dissected by numerous small washes that converge into two main broad washes, Deadman Wash and New River, flowing southerly or southwesterly into the Agua Fria River. Floodplains are typically composed of clayey alluvium, and slopes and terraces are composed of mid-Pleistocene gravel deposits (Brown 1994). The soil temperature regime in the project area has mean annual soil temperatures of 72°F or higher. These soils are often subject to seasonal, brief flooding from nearby rivers and washes (Hendricks 1985).

The mixture of plants and animals found in the project area suggests a transition zone between the lower edge of the Arizona Upland and the upper edge of the Colorado River Valley subdivisions of the Sonoran Desert (Brown 1994). Segments 2 and 4 consist primarily of creosotebush-dominated plant associations which include shrubs like creosotebush (*Larrea tridentata*), white bursage (*Ambrosia deltoida*), and other shrubs and various species of cacti. Large trees are not typically seen except along washes. Segment 1 consists primarily of paloverde-mixed cacti plant associations including trees such as foothill paloverde (*Cercidium*

microphyllum), desert ironwood (*Olneya tesota*), velvet mesquite (*Prosopis velutina*); cacti such as saguaro (*Carnegiea gigantea*), buckhorn cholla (*Opuntia versicolor*), and California barrel cactus (*Ferocactus acanthodes*); and shrubs such as triangle-leaf bursage (*Ambrosia deltoidea*), brittlebush (*Encelia farinosa*), and ocotillo (*Fouquieria splendens)* (Spicer and Gilbert 1999).

Riparian ecosystems in the project area have developed in response to patterns of flooding, groundwater fluctuation, and impoundment structures (Briggs 1996). Riparian corridors in the project area are ephemeral, flowing only in direct response to precipitation in the immediate area.

Xeroriparian areas exhibit a greater diversity of plants and animals than those areas between the washes, and support more and larger individuals of many plants that also grow on the intervening hills. Characteristic species include desert ironwood, velvet mesquite, foothill paloverde, blue paloverde, desert hackberry (*Celtis pallida*), Mormon tea (*Ephedra trifurca*), catclaw (*Acacia greggii*), desert lavender (*Hyptis emoryi*), canyon ragweed (*Ambrosia ambrosioides*), chuckwalla's delight (*Bebbia juncea*), trixis (*Trixis californica*), desert Christmas cactus (*Opuntia leptocaulis*), virgin's bower (*Clematis* spp.), and climbing milkweed (*Sarcostemma cynanchoides*) (Spicer and Gilbert 1999).

4.3.2 Wildlife

The project area provides a variety of habitats for a diverse group of birds, mammals, and reptiles. Increased water and organic material, located in particular along washes and in their adjoining floodplains and low terraces, have resulted in increased vegetation, creating conditions attractive to a greater number and variety of animals.

Wildlife that may be observed along roadsides includes desert cottontail (*Sylvilagus audubonii*), black-tailed jack rabbit (*Lepus californicus*), Harris's antelope squirrel (*Ammospermophilus harrisii*), coyote (*Canis latrans*), Gila woodpecker (*Melanerpes uropygialis*), raven (*Corvus corax*), mourning dove (*Zenaida macroura*), and the nonnative rock dove (*Columba livia*). Species observed in the project vicinity include red-tailed hawk (*Buteo jamaicensis*), Gambel's quail (*Callipepla gambelii*), Gila woodpecker (*Melanerpes uropygialis*), western kingbird (*Tyrannus verticalis*), ash-throated flycatcher (*Myiarchus cinerascens*), brown-crested flycatcher (*Myiarchus tyrannulus*), swallows, common raven (*Corvus corax*), verdin (*Auriparus flaviceps*), black-tailed gnatcatcher (*Polioptila melanura*), phainopepla (*Phainopepla nitens*), northern cardinal (*Cardinalis cardinalis*), curve-billed thrasher (*Toxostoma curvirostre*), zebra-tailed lizard (*Callisaurus draconoides*), desert spiny lizard (*Sceloporus magister*), side-blotched lizard (*Uta stansburiana*), western whiptail (*Cnemidophorus tigris*), western diamond-backed

rattlesnake (*Crotalus atrox*), ringtail (*Bassariscus astutus*), collared peccary (*Pecari tajacu*), and kit fox (*Vulpes macrotis*) (Spicer and Gilbert 1999).

No-Build Alternative

If the No-Build Alternative is selected, the proposed project would not be built and wildlife would not be impacted as the direct result of the project. Future development of the area is expected to continue and arterial roads likely would be extended or developed to support this growth, impacting naturally occurring native vegetation in the area. Due to the lack of specific information on site development that could occur, it is difficult to assess specific potential impacts of the No-Build Alternative in the project area. However, various degrees of long- and short-term impacts to wildlife may be expected as encroachment onto habitat occurs.

Impacts of the Proposed Project

Populations of animals will not be significantly affected by the proposed project; however, disturbance to individuals and elimination of components of wildlife habitat would occur during construction and include displacement of animals and possible mortality to burrowing animals. Human-related disturbance over the long term will damage, reduce, or eliminate vegetation or other ground cover and disturb the ground surface, resulting in degradation, destabilization, elimination, or change of biological communities, community components, and ecological processes (Spicer and Gilbert 1999). In some portions of the project area, wildlife habitat is fragmented by urban development and existing roadways, and this project would further hinder north-south wildlife movements by bisecting potential habitat. Large washes and smaller drainages in the area provide opportunities for habitat connectivity.

Approximately 54 ephemeral washes could be disturbed by the project (see Section 4.2, Water Resources). As noted in Section 4.2, these crossings would require the installation of drainage structures or concrete box or pipe culverts. Temporary disturbance of washes, and therefore to wildlife movement, would occur during construction. After construction and the placement of drainage structures, wildlife could resume movement along the smaller drainages and the five major washes in the project area.

Mitigation

To lessen or avoid potential impacts to general wildlife in the project area, removal or disturbance of vegetation would be minimized through project design as practicable. In areas where native vegetation must be removed, would restore to natural conditions by reseeding with species native to the area and replacing trees and shrubs with native species instead of

landscaped exotic species. Culverts would be designed and sized to minimize the effects of habitat fragmentation by providing opportunities for movement of wildlife across the proposed project. As identified in the Design Concept Report (URS 2005b), culverts in the project area would range in size from 36 inches to 10 feet by 12 feet. During final design, ADOT would coordinate with AGFD to address further concerns regarding habitat connectivity. In addition, culvert sizes and locations may be modified to accommodate the final design of the project.

Conclusion

The project may have both short- and long-term effects on individual animals, their habitats, and regional movement patterns; however, by adhering to the mitigation measures, impacts would be avoided or lessened.

4.3.3 Threatened and Endangered Species

A list of federally listed endangered, threatened, proposed, and candidate species was obtained from the U.S. Fish and Wildlife Service Arizona Ecological Services Web site (2004). Twelve species were reviewed by a qualified biologist (Jean Paul Charpentier, URS). Of the total, one federally listed endangered species, the lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*) has the potential for occurring within the project area. Federally listed threatened species include the bald eagle (*Haliaeetus leucocephalus*). The previously-listed endangered cactus ferruginous pygmy owl (*Glaucidium brasilianum* cactorum) is included here for discussion in the event that, through potential future litigation, the species is re-listed. In addition to the federally listed species, one sensitive species, the Sonoran desert tortoise (*Gopherus agassizii),* has the potential of occurring in the project area. For a list of federally listed species excluded from further evaluation and the reasons for their exclusion, please see the Biological Evaluation (URS 2004d).

No-Build Alternative

If the No-Build Alternative is selected, the proposed project would not be built and federally listed species would not be impacted as the direct result of the project. Although future development is expected in the general area, no impacts would be anticipated because suitable habitat does not exist for the bald eagle or lesser long-nosed bat. In addition, the area is outside the current known geographical range for the cactus ferruginous pygmy-owl.

Impacts of the Proposed Project

Bald Eagle

Within the project area, riparian habitat includes the Agua Fria River, New River, and Deadman Wash. These areas are not considered suitable nesting habitat for eagles because they are classified as ephemeral, or dry most of the year; therefore, available food is absent most of the year. The nearest known bald eagle nest is located at Lake Pleasant, approximately 4.5 miles north of the proposed project area. Noise from construction activities is not expected to disturb nesting eagles at Lake Pleasant. Based on these considerations, the proposed project is not expected to affect the bald eagle or its habitat.

Cactus Ferruginous Pygmy-Owl

Currently, cactus ferruginous pygmy-owls have limited distribution in southern Arizona, and it is unlikely they would occur so far north of their current geographical range as central Arizona. Numerous surveys conducted in Maricopa County in recent years have recorded no owls.

Within the project area, riparian corridors provide minimal suitable habitat components for pygmy-owls; for example, vegetation density and structural diversity preferred by the owl for nesting, roosting, and traveling, are minimal. The nearest known nest is located about 120 miles to the southeast in northwest Tucson in Pima County.

Lesser Long-Nosed Bat

The nearest bat roost is located at Picacho Peak in Pinal County, approximately 100 miles south of the study area. The foraging range of the bat is approximately 40-45 miles each night from a roost site.

From April through July in Arizona, females are found mostly in areas with flowering saguaros at elevations below 3,500 feet. During July, their range expands into elevations up to 5,500 feet to include agave blossoms. By late September, all lesser long-nosed bats have departed Arizona for the winter. Habitat within the project area includes columnar cacti such as saguaros and one or two species of agaves; however, the abundance of such food plants in the project area is low, thus providing little foraging opportunity for this species. The study area is not considered suitable habitat, and is outside the known range of this species; therefore the proposed project would not affect the lesser long-nosed bat or its habitat.

Mitigation

No mitigation measures would be necessary because the proposed project area is (1) outside the current geographical range of the cactus ferruginous pygmy-owl and lesser long-nosed bat and (2) contains no suitable habitat for the bald eagle.

Conclusion

The proposed project would have no effect on the threatened bald eagle, endangered lesser long-nosed bat, or recently de-listed cactus ferruginous pygmy owl; therefore, no mitigation measures would be required.

4.3.4 Sensitive Species

Sonoran Desert Tortoise

The Sonoran population of the desert tortoise has no federal status under the Endangered Species Act; however, it is included as Wildlife of Special Concern by the AGFD. The Sonoran desert tortoise occurs primarily on rocky slopes and bajadas of Mojave and Sonoran desertscrub. Populations occur at elevations ranging from about 510 feet in Mojave desertscrub to about 5,300 feet in semidesert grassland and interior chaparral. Within the study area, the desert tortoise typically occurs on bajadas in paloverde-mixed cacti associations in the Arizona Upland Subdivision of the Sonoran Desert. Adequate shelter is one of the most important habitat components of tortoises in the Sonoran Desert. They require loose soil in which to dig burrows below boulders and rocks and sometimes under vegetation. In washes, they may dig burrows in the sides of incised wash banks. Tortoises eat a variety of annual and perennial grasses, forbs, cactus fruits, and succulents.

No-Build Alternative

If the No-Build Alternative is selected, the proposed project would not be built and sensitive species would not be impacted as the direct result of the project. However, continued development in the area is still anticipated, which will have various degrees of long- and short-term impacts to the desert tortoise.

Impacts of the Proposed Project

Suitable foraging and shelter habitat exists in the project area, particularly in washes and adjacent upland areas. The removal of vegetation would impact tortoise habitat by destroying forage plants and shelter sites and individuals may be impacted by construction activities. In addition, indirect effects such as habitat fragmentation and mortality due to vehicle collision on

the new highway could occur. Therefore, the project may impact individual desert tortoises and their habitat, but is not likely to result in a trend toward federal listing or loss of viability due to the relatively small amount of tortoise habitat that would be affected.

Mitigation

Suitable Sonoran desert tortoise habitat exists in the project area; therefore, mitigation measures may be needed. The Arizona Game and Fish Department has developed guidelines to reduce potential impacts to desert tortoises, and to promote the continued existence of tortoises throughout the state. These guidelines apply to short-term projects such as roadway construction. AGFD's *Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects* is included as Appendix B. The contractor would adhere to provisions of the guidelines in the event that a tortoise is encountered during construction. Additionally, the installation of culverts and drainage structures sized to allow tortoises to pass through them, as discussed in Section 4.3.2, would provide opportunities to maintain habitat connectivity and reduce mortality from vehicle collisions during the life of the project. Culverts in the project area would range in size from 36 inches to 10 feet by 12 feet.

Conclusion

The proposed project may impact individual desert tortoises or their habitat; however, by adhering to the mitigation measures, impacts would be avoided or minimized. In addition, implementation of the proposed project would not result in a trend towards federal listing of this species.

4.3.5 Protected Native Plants

The Arizona Native Plant Law (ANPL) applies to listed plants that are naturally occurring, but not to landscaped or planted individuals. Native plants that are protected by the ANPL include all cacti, yucca, agave, and many leguminous tree species such as paloverdes, mesquites, and ironwoods that are naturally occurring at their location. Jean Paul Charpentier of URS surveyed the project area on May 29, 2003, for protected native plants listed by the Arizona Department of Agriculture (ADA). Foothill paloverde (*Cercidium microphyllum*), ocotillo (*Fouquieria splendens*), velvet mesquite (*Prosopis velutina*), catclaw acacia (*Acacia greggii*), Arizona barrel cactus (*Ferocactus wislizenii*), and saguaro (*Carnegiea gigantea*) were found in the area.

No Build Alternative

If the No-Build Alternative is selected, the proposed project would not be built and impacts to native plants would not occur as the direct result of the proposed project. However, future development of the area is expected to continue and arterial roads likely would be extended or developed to support this growth, impacting native plants protected by the ANPL. Due to the lack of specific information on site development that could occur, it is difficult to assess potential impacts of the No-Build Alternative to protected native plants. However, state regulatory requirements would continue to apply to any development proposals.

Impacts of the Proposed Project

Protected native plants within the project limits would be impacted by this project. The proposed project would require the removal of native plants, grading of surface soils, and construction of roadway surface structures across undeveloped desertscrub plant communities.

Mitigation

The ADOT Roadside Development Section would notify the Arizona Department of Agriculture at least 60 days prior to the start of construction so that the ADA can determine the disposition of any protected native plants occurring within the project limits.

Conclusion

The project may impact protected native plants; however, through following the provisions of the ANPL and coordination with the Arizona Department of Agriculture on mitigation efforts, impacts may be avoided or minimized.

4.3.6 Invasive Species

Under Executive Order 13112, dated February 3, 1999, projects that occur on federal lands or are federally funded must, "subject to the availability of appropriations, and within Administration budgetary limits, use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to, and control, populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably …; [and] (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded."

A current list of Arizona noxious weeds is provided in Appendix E. This assessment assumes that noxious weeds will be present within the project area both under the No Build Alternative, and with the Proposed Project at the time of construction. Therefore, the mitigation measures outlined below would be implemented.

Mitigation

To prevent the introduction of invasive species seeds, all construction equipment would be washed prior to entering the construction site. To prevent invasive species seeds from leaving the site, the contractor would inspect all equipment and remove attached plant/vegetation debris prior to leaving the construction site. All disturbed soils that would not be landscaped or otherwise permanently stabilized by construction would be seeded using species native to the project vicinity.

4.3.7 Summary Conclusion

The proposed project would have no effects to endangered and threatened species; therefore, no mitigation measures for endangered and threatened species would be required. The proposed project may impact individual desert tortoises or their habitat; however, impacts could be avoided or minimized by adhering to the mitigation measures. The proposed project would impact protected native plants. These impacts would be mitigated by notifying the Arizona Department of Agriculture and by revegetating disturbed areas with native plant species., Preventing the potential spread of invasive weed species will be accomplished by implementing the mitigation measures.

4.4 VISUAL RESOURCES

4.4.1 Existing Conditions

Existing conditions associated with visual resources are evaluated through assessment of landscape character, scenic quality, and sensitive viewers in the study area.

Landscape Character Assessment

The landscape character assessment is based on existing federal classification systems used to determine the value of specific landscapes. Areas of land are delineated and classified to type according to their distinguishing physical, cultural, and visual characteristics. Each area is further delineated into smaller descriptive landscape character units whenever appropriate to discern and document a higher level of detail. The hierarchy of landscape character subdivision has four different levels:

1. *The Landscape Character Type*: A regional area of land distinguished by common physical and visual characteristics unique within a larger area (greater than 5,000 acres).
2. *The Landscape Character Subtype:* A subregional area of land of substantial size (less than 5,000 acres but more than 2,500 acres), with additionally distinguishing physical and visual characteristics.

Given the overall homogeneity of landscapes within the study area, the two remaining scales of landscape character were not evaluated in detail:

1. *The Landscape Character Unit*: A local area of considerable size (between 500 and 2,500 acres), distinguished by common physical and visual characteristics unique within a larger area.
2. *The Landscape Character Subunit:* A local area of land of small to moderate size (less than 500 acres in size. The sub-unit represents the smallest scale landscape in the landscape character classification system.

The landscape character assessment began with an examination of the physical characteristics of the natural and cultural features that are contained within the landscapes of the project study area. The predominant visual characteristics of the landscape, including elements of form, line, color, and texture, considered along with scale and landscape composition, were then derived from the physical characteristics of the natural and cultural features within the project area. The following sections contain a detailed description of the landscape assessment.

Landscape Character Type

The study area, located northwest of the Phoenix metropolitan area in Maricopa County, Arizona, occurs within an area designated as the Sonoran Desert landscape character type. Notable natural features include the White Tanks Regional Park (west of the study area), Estrella Mountain Regional Park (in the south distant background), Agua Fria River, and Lake Pleasant (northwest of the study area); all are designated as natural open space features. The majority of the natural landscape settings can be characterized as relatively flat, open desert plains, dissected by intermittent riparian tributaries and isolated mountain and foothill lands.

The vegetation within the study area is characteristic of typical Sonoran Desert native vegetation. The prominent vegetation community can be characterized as southwestern desertscrub, as described by Charles Lowe (1964). The vegetative palette is composed of numerous species of trees (foothill paloverde, ironwood, saguaro, and mesquite), cacti (barrel, cholla, prickly pear), creosotebush, brittlebush, and scrubgrasses.

Cultural manmade modifications in the study area include but are not limited to roadways (e.g., Lake Pleasant Parkway/New River Road, SR 74, and I-17), pipelines, and flood diversion facilities. Two major canals that transport water in the study area include the CAP Canal and the Beardsley Canal. Numerous existing substations and high-voltage transmission line corridors, telephone and distribution power lines, and communication towers, compose a majority of the overhead infrastructure in the area.

Landscape Character Subtypes

Three primary subtypes of landscape character occur within the study area, including the Desert Valley Lands, Desert Mountain Lands, and Desert River Lands subtypes. These are described in detail in the following sections.

Desert Valley Lands Subtype

The Desert Valley Lands subtype is the dominant subtype of both the study area and the valley floor of the Sonoran Desert in general. This subtype generally encompasses island-like eminences of the Desert Mountain Lands subtype.

Composed of very wide valley plains and landforms associated with the valley rivers and arroyos that are tributaries of major rivers (such as Agua Fria River and New River), the dominant impression of this subtype is of an expansive, slightly sloping plain, with minimal topographic relief.

The rivers and dry arroyos that dissect these valley plains are typically ephemeral features that contain water only for short periods of time immediately following the summer monsoons and winter rains. For the remainder of the year these drainage features remain mostly dry.

Desert Mountain Lands Subtype

The Desert Mountain Lands subtype encompasses distinctive mountains of the Sonoran Desert. These mountain features are generally widely separated by valley plains and, like islands in a sea, rise majestically from the desert floor. Within the region and surrounding the study area, such landmarks include the White Tank and Sierra Estrella Mountains. This subtype also includes other eminences of lesser size and scale, such as Lone Mountain.

Mountains of this subtype characteristically possess a steep and rugged dissected upper-mountain slope, joined in the lower elevations by a progression of rolling foothills; and slightly upward-sloping bajadas, composed of a series of alluvial fans that form a skirt around the base of

the mountain. Desert bajadas are typically drained by a combination of sheet flow and numerous drainage channels that contribute to their characteristic, slightly rolling topography (e.g., Lone Mountain). These drainage features are highly susceptible to changes in their form and location within the bajada.

Desert River Lands Subtype

The Desert River Lands subtype contains rivers and dry arroyos of the type found within the study area. These drainages include primarily the Agua Fria River, New River, Deadman Wash, and Skunk Creek. These are part of a large tributary system that drains a majority of the mountain and valley lands of the Sonoran Desert within the study area to the Gila River.

This subtype characteristically includes large-scale entrenched river channels, along with a related broad floodplain terrace system. These two landforms usually occur in parallel. Natural segments of the river systems contained within this subtype are typified by a high potential for lateral migration and establishment of new river channel landforms within the floodplain terrace.

Lakes and reservoirs are unusual occurrences within the Desert River Lands subtype. Lake Pleasant, however, is a notable exception; this large, year-round lake is a dominant feature attraction and provides a unique respite within an otherwise arid region.

Landscape Character within the Proposed Project Area

The landscapes inventoried along Segments 1, 2, and 4 primarily occur within the Desert Valley Lands subtype, but they also contain smaller portions of the Desert River Lands subtype where Segment 1 traverses the Agua Fria River and Segment 2 traverses Deadman Wash and New River.

Scenic Quality Assessment

Scenic quality is described as the effect created by both the natural or manmade elements that constitute a given setting. A landscape's scenic quality is determined by evaluating the uniqueness and diversity of its contents, including landform, vegetation, water, cultural features, and adjacent scenery. Specific evaluations are then used to rank landscapes according to their relative distinctive quality.

Landscapes within the study area were characterized according to the following scenic quality classifications to identify their relative scenic value. Generally, Class A landscapes are those that contain a greater amount of scenic interest and diversity (e.g., areas around Lake Pleasant and

along portions of the Agua Fria River and New River); Class C landscapes are those that contain the least scenic interest and diversity (e.g., flat desert scrub land).

- Class A – Areas of outstanding diversity or interest; characteristic features of landform, rock, water, and vegetation are distinctive or unique in relation to the surrounding region. These areas contain considerable variety in form, line, color, and texture.
- Class B – Areas of above average diversity or interest providing some variety in form, line, color, and texture. The features are not considered rare in the surrounding region, but provide adequate visual diversity to be considered fairly unique.
- Class C – Areas of minimal diversity or interest where representative features have limited variation in form, line, color, or texture within the context of the surrounding region.

Most of the landscapes inventoried within the study area can be characterized as Class C (Figure 4-4), with intermittent areas of Class B landscapes occurring along the preferred alignment. Class A landscapes are limited to portions of the Agua Fria River and New River, as well as notable vertical features (e.g., Lone Mountain). Figure 4-4 depicts representative existing and future viewshed locations along the preferred alignment.

Scenic Quality within the Proposed Project Area

The landscapes along Segment 1 are mainly Class C scenic quality landscapes (69 percent), with smaller areas of Class B (15 percent) and Class A (16 percent) landscapes. Landscapes along Segment 2 are mainly Class C landscapes (62 percent), with few occurrences of Class B (6 percent) and Class A (32 percent) landscapes. Landscapes along Segment 4 are mainly Class C (67 percent) landscapes, with few occurrences of Class B (1 percent) and Class A (32 percent) landscapes.

Sensitive Viewers Assessment

The study area is composed largely of undeveloped land with the following exceptions: (1) two areas of residential and commercial development (on land adjacent to I-17 and land northeast of the Westwing Receiving Station), (2) several intermittent areas of development along the Beardsley Canal, and (3) the Ben Avery Shooting Range, located west of I-17 along SR 74. Lake Pleasant is located northwest of the study area. Travelers along New River Road and Lake Pleasant Parkway, as well as those on I-17, would have views of the proposed project as would hikers on existing trails within the area. Designated open space within the study area is limited to

the Thunderbird Park and Adobe Dam Recreation Area (both on the southern fringes of the study area). Additionally, several areas within the interior of the study area are proposed for Sonoran Preserve designation.

Future plans for development within the study area include residential, commercial, utility, and industrial uses. Commercial uses would be located primarily along the I-17 corridor, Lake Pleasant Parkway, SR 74, and New River Road, as well as within proximity of the Westwing Receiving Station. Most of the land north of SR 74 and east of New River Road is planned for mixed commercial and public developments. Most of the land south of SR 74 and east and west of Lake Pleasant Parkway is reserved for proposed residential and open space. A few intermittent areas of industrial development are located primarily in the central portion of the study area along Lake Pleasant Parkway. Further, a proposed APS 230 kilovolt (kV) power line would be constructed north of the preferred alignment.

Sensitive Viewers within the Proposed Project Area

The presence of sensitive viewers along Segment 1 would be limited to areas near the Westwing Receiving Station and areas along the Beardsley Canal. Sensitive viewers have not been identified along Segment 2, as the land is undeveloped. The presence of sensitive viewers along Segment 4 is currently limited to travelers along SR 74, where Segment 4 would tie to this existing state highway alignment.

4.4.2 Impacts and Mitigation

No-Build Alternative

If the No-Build Alternative is selected, the proposed project and its associated interchanges would not be built. The interim expressway between US 60 and Happy Valley Parkway would remain; however, the portion of the SR 303L from 43rd Avenue to the I-17 interchange, considered in a separate EA, would not be built. Future development of the area is expected to continue and some arterial roads likely would be extended or developed to support this development. Continued development of the area is expected to occur if the No-Build Alternative is selected, resulting in changes to the visual setting. Impacts on visual resources associated with the No-Build Alternative are anticipated to be low based on the limited scenic value and the current lack of sensitive viewers in the area. At this time, it is difficult to specify the location of potential future sensitive viewers in the project area or the specific visual impact of site developments that have not yet been designed.

Proposed Project

Potential impacts on visual resources associated with the proposed project are anticipated to be low, based on (1) limited scenic value, (2) the lack of sensitive viewers in the project area, and (3) design components incorporated into the project description that would be effective in reducing impact levels. These components include the construction of project features using materials that complement the surrounding landscape's colors and textures. In addition, retaining walls associated with any rock cuts would be compatible with the rugged form, textures, colors, and lines of the surrounding setting and with those of the new retaining walls, to the extent practicable. Required bridges would be painted to blend with the desert nature of their surroundings, to the extent practicable.

In addition, ADOT has been coordinating with stakeholders, including jurisdictions with the authority to regulate land use, throughout project development. One outcome of this coordination is that the Cities of Phoenix and Peoria can plan to minimize future conflicts between SR 303 and future residential developments, or other sources of sensitive viewers.

1.1.3 Conclusion

Currently, lands along this segment are undeveloped, or developed for commercial and mixed land uses; their scenic qualities have been assessed as low. It therefore is not likely that either the No-Build Alternative or the proposed project would adversely affect visual resources.

4.5 AIR QUALITY

4.5.1 Existing Conditions

The National Ambient Air Quality Standards (NAAQS) were established by the federal Clean Air Act of 1970 as amended in 1977 and 1990. The NAAQS represent the maximum levels of pollution considered safe, with an adequate margin of safety, to protect the public health and welfare. The six primary air pollutants of concern for which the NAAQS have been established are ozone (O_3), sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), lead (Pb), and particulate matter equal to or less than 10 microns in aerodynamic diameter (PM_{10}).

On July 18, 1997, the U.S. Environmental Protection Agency (EPA) redefined NAAQS for O_3 and particulate matter. The NAAQS for O_3 is 0.08 parts per million (ppm) averaged over 8 hours. The NAAQS for particulate matter added another category for smaller particles—$PM_{2.5}$ (particulate matter with an aerodynamic diameter equal to or smaller than 2.5 microns) must not exceed an annual average of 15 micrograms per cubic meter ($\mu g/m^3$) and a 24-hour average of 65 $\mu g/m^3$. The PM_{10} standards were essentially retained.

Portions of Maricopa County, including the study area, were designated as nonattainment areas for the NAAQS for O_3, CO, and PM_{10}; however, on January 5, 2005, the EPA redesignated the Maricopa County area to attainment with a maintenance plan for the CO standard. The Clean Air Act sets planning requirements to ensure attainment of the NAAQS by specific deadlines. Foremost among these requirements is adoption and implementation of air quality attainment plans. Air quality planning documents that have been prepared to address CO, O_3, and PM_{10} issues associated with the Maricopa County nonattainment area are the following:

- *One-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area (obtained January 5, 2005)*
- *Revised MAG 1999 Serious Area Carbon Monoxide Plan for the Maricopa County Nonattainment Area*
- *Carbon Monoxide Redesignation Request and Maintenance Plan for the Maricopa County Nonattainment Area*
- *Revised 1998 15 percent Rate of Progress Plan for Ozone (Revised ROP FIP) for the Maricopa County Nonattainment Area*
- *Final Serious Area Ozone State Implementation Plan for Maricopa County*
- *Revised MAG 1999 Serious Area Particulate Plan for PM_{10} for the Maricopa County Nonattainment Area*

The Maricopa County Environmental Services Department (MCESD) has jurisdiction over air quality programs in Maricopa County, including the project area. The Maricopa County Air Pollution Control Rules & Regulations, developed by MCESD, also are applicable to the proposed project. These rules and regulations constitute the legal basis for control of air pollution sources in Maricopa County.

The MCESD operates a series of air quality monitoring stations throughout the Phoenix metropolitan area. The existing air quality data for CO, PM_{10}, and O_3 were collected from the Glendale monitoring station at 6000 West Olive Avenue. To characterize existing air quality in the study area, the data monitored at this station during the most recent years available (2000 to 2003) were evaluated. Based on the Glendale monitoring data, there were no exceedances of the NAAQS for O_3 (1-hour), CO, and PM_{10} from 2000 to 2003. The 8-hour O_3 NAAQS was exceeded one or two times from 2000 to 2003.

Conformity

The 1990 Clean Air Act Amendments and the federal conformity rule (40 CFR Parts 51 and 93) require transportation projects to conform to (be consistent with) air quality implementation plans. The conformity rule applies nationwide to "all nonattainment and maintenance areas for transportation-related criteria pollutants for which the area is designated nonattainment or has a maintenance plan" (40 CFR 93.102). To be a conforming project, it must be a part of an approved transportation plan and program and must not result in violations of the federal CO standard in the area substantially affected by the project as shown by a project level analysis.

MAG is the designated Metropolitan Planning Organization in Maricopa County, Arizona, and is responsible for regional transportation and air quality planning. The proposed project is contained within the current MAG RTP and program (Fiscal Year 2004-2007 Special MAG Transportation Improvement Program [MAG 2003b]). The programs are assimilated into the Statewide Transportation Improvement Program after demonstration that the proposed programs comply with the State Implementation Plan for attaining the NAAQS. On December 9, 2003, the FHWA determined that the RTP conforms to the State Implementation Plan.

Climate/Meteorology

Meteorological and climatological conditions influence ambient air quality. Temperatures in the project area are typical of desert climatology, ranging from 40°F to 45°F during the winter to more than 100°F during the summer. Precipitation in the area is sparse and is limited primarily to rainfall, although traces of snow have been reported in this area. Rainfall occurs primarily from July through March. Large amounts of warm, moist air moving from the Gulf of Mexico can create heavy thunderstorms across Arizona. The prevailing wind direction in this area is from the east, with an annual mean speed of 6.2 miles per hour (mph).

4.5.2 Impacts

No-Build Alternative

Under the No-Build Alternative, construction of new arterial roads and extension of existing roads would occur to serve area development. As a result, air emissions associated with construction activities as they relate to arterial roads would occur. In addition, according to the traffic report, congestion would increase because the arterial roads network would not move traffic as efficiently as the proposed project (URS 2005a).

Proposed Project

Construction-related soil disturbance and operation of heavy equipment would produce an increase in particulate matter during roadway construction, but these impacts would be short-term in nature and mitigated as described in Section 4.5.3 – Mitigation.

Project-level CO modeling analyses for the year 2030 (the year of full development of the proposed project) were conducted using the EPA-approved CAL3QHC dispersion model to predict ambient CO impacts associated with the proposed project. Ambient CO levels are most affected near congested intersections and roadway segments. To predict the worst case (maximum) CO impacts, the CO modeling analyses focused on the area of the proposed project that was predicted to be the most congested (URS 2005a). MOBILE6.2 was used to estimate composite CO emission factors for vehicles at traveling and idling situations. A summary of the estimated total maximum CO concentrations for the most congested areas within the project area, including background CO concentrations, is presented in Table 4-2. As shown in Table 4-2, the maximum total 1-hour and 8-hour CO concentrations estimated for the project area would be below the NAAQS for CO; therefore, the proposed project would not adversely affect ambient CO levels.

Table 4-2
Summary of Estimated Maximum CO Concentrations

Modeling Area	Maximum Total Concentrations (ppm)	
	1-hour	8-hour
Project Area (Area 2 in Air Quality Report)	3.30	2.31
Project Area (Area 3 in Air Quality Report)	4.10	2.87
NAAQS (ppm)	35	9
Exceeds Standard	No	No

Source: URS 2004b

4.5.3 Mitigation

Fugitive dust generated from construction activities would be controlled in accordance with the ADOT *Standard Specifications for Road and Bridge Construction*, Section 104.08 (2000 Edition), special provisions, and local rules or ordinances. According to the ADOT *Standard Specifications for Road and Bridge Construction*, (2000 Edition), Section 104, "Scope of Work," Subsection 08, "Prevention of Air and Noise Pollution," "[t]he contractor would control, reduce, remove or prevent air pollution in all its forms, including air contaminants, in the performance of the contractor's work." The contractor would comply with all air pollution ordinances,

regulations, orders, etc., during construction. All dust-producing surfaces would be watered or otherwise stabilized to reduce short-term impacts associated with an increase in particulate matter attributable to construction activity.

ADOT requires contractors working on any ADOT project to implement the ADOT *Standard Specifications for Road and Bridge Construction* (2000 Edition). In addition, an Earth Moving Permit incorporating an agency-approved Dust Control Plan would be obtained prior to project construction phases under MCESD Rules 200 and 310. By implementing the ADOT specifications and the requirements under MCESD Rule 310, the potential for air quality impacts related to roadway construction activities would be substantially reduced. Air quality would not be adversely affected during the project construction phases.

To minimize emissions from idling and slow moving traffic in the construction zones, traffic control would be in accordance with the most current *Manual on Uniform Traffic Control Devices for Streets and Highways*, published by the FHWA, including any revisions or additions, and/or associated provisions in the project plans, as determined by the ADOT Traffic Design Section during design.

4.5.4 Conclusion

The No-Build Alternative would produce air emissions due to construction activities related to arterial roads. In addition, according to the traffic report, the No-Build Alternative would result in a congested arterial road network because the arterial roads would not move traffic as efficiently as the proposed project (URS 2005a). Because ambient CO levels are highest near congested intersections and roadway segments, CO levels would be higher than if the more efficient roadway network (the proposed project) were constructed.

The proposed project would result in construction-related soil disturbance and operation of heavy equipment, which would produce an increase in particulate matter during roadway construction. However, these impacts would be short-term in nature and mitigated. The project-level CO modeling analyses show that the proposed project would not cause a new violation of the NAAQS nor increase the frequency or severity of an existing violation of the NAAQS. The approach for the CO analyses is consistent with the requirements of the federal transportation conformity rule (40 CFR Parts 51 and 93). The design concept and scope of the proposed project are consistent with the design concepts and scopes analyzed by MAG for the RTP. Therefore, pursuant to the transportation conformity rule, the proposed project conforms to the State Implementation Plan for achieving NAAQS. Particulate emissions resulting from construction of the proposed project would be effectively mitigated by implementing ADOT standard specifications on dust generation and by effectively managing traffic through detour areas.

4.6 NOISE

4.6.1 Existing Conditions

Fundamentals of Traffic Noise

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound typically associated with human activity and that interferes with or disrupts normal activities. Although exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, perceived importance of the noise and its appropriateness in the setting, time of day and type of activity during which the noise occurs, and sensitivity of the individual.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by several variables, including frequency and intensity. Frequency describes the sound's pitch and is measured in hertz (Hz), whereas intensity describes the sound's loudness and is measured in decibels (dB). Decibels are measured using a logarithmic scale. A sound level of 0 dB is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above about 120 dB begin to be felt inside the human ear as discomfort and eventually as pain at still higher levels. The minimum change in the sound level of individual events that an average human ear can detect is about 3 dB. The average person perceives a change in sound level of about 10 dB as a doubling (or halving) of the sound's loudness; this relation holds true for sounds of any loudness.

Sound from a tuning fork (a pure tone) contains a single frequency; however, most sounds one hears in the environment do not consist of a single frequency but a broad band of frequencies differing in sound level. The method commonly used to quantify environmental sounds consists of evaluating all of a sound's frequencies according to a weighting system that reflects the fact that human hearing is less sensitive at low frequencies and extremely high frequencies than at mid-range frequencies. This is called "A" weighting, and the decibel level measured is referred to as the A-weighted decibels (dBA). In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

Although the dBA may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a conglomeration of noise from distant sources that creates a relatively steady background noise in

which no particular source is identifiable. A single descriptor called the L_{eq} (equivalent sound level) is used to quantify these multiple noise sources. ADOT and the FHWA use the 1-hour L_{eq} ($L_{eq}(h)$) during the peak-traffic-noise period to assess potential noise impacts and determine necessary abatement measures for roadway noise.

Noise Characteristics of Vehicles and Roadways

Roadway noise is dependent on many factors:

- Vehicle type and speed
- Number of vehicles
- Roadway surface and gradient
- Distance from the roadway to the receiver
- Relative location of a receptor to noise source
- Ground surface characteristics (whether acoustically reflective or absorptive, "pavement" or vegetation")
- Meteorological factors such as wind and temperature gradients
- Shielding due to structures, sound walls, earthen berms, hills, or the edges of roadways

Generally, if vehicle speed and/or traffic volume increases, so does the noise level. However, heavy trucks typically operate at a more constant noise output than automobiles regardless of speed, because they retain a nearly constant engine speed in revolutions per minute.

The noisiest component from cars is typically the tires and the tire/road interface, while for most trucks much of the noise emanates from the exhaust stack. This affects the noise reduction provided by a barrier because both the height and proximity of the source and receiver with respect to the barrier's location and height are important in determining the effectiveness of the barrier.

Roadway surface and gradient also affect the resultant noise. Surfaces vary from rough and potholed to smooth and seal-coated, and this can lead to an approximate difference of 3 to 4 dBA in generated noise levels among different types of surfaces (Bolt, Beranek, and Newman, Inc. 1973). Primarily, the roadway gradient influences noise levels for heavy truck traffic; the greatest effect is from an uphill grade, which increases noise levels.

Existing Noise Environment

The proposed project is located in an area that is primarily rural or undeveloped and is composed of desertscrub with varying elevations and small watersheds. Segment 1 is populated with

scattered single-family residences. The primary noise sources in this area are vehicular traffic, small aircraft overflights from the Deer Valley Airport, military jet aircraft overflights, and construction activities. There are no noise-sensitive receptors within 2,600 feet of Segments 2 or 4.

A series of sound level measurements was taken on March 30 and 31, 2004, at the closest residences within Segment 1 to quantify the existing noise environment near the proposed project. Two types of sound level measurements were conducted: short term (20-minute duration) and long term (24-hour duration). The results of the short term measurements are summarized in Table 4-3 and the results of the long term measurements are summarized in Table 4-4. The locations at which short term and long term noise levels were measured are presented in Figure 4-5. Meteorological conditions were measured also, since atmospheric conditions can cause noise levels to fluctuate by 10 dBA or more at locations distant from freeways (see Noise Technical Report, dated September 2004, for additional information [URS 2004e]).

Table 4-3
Short-Term Sound Level Measurements (dBA)

Measurement Identification	Time	$L_{eq(h)}$
ST1	08:35 – 08:55	58.1
ST2	09:05 – 09:25	56.9
ST3	09:30 – 09:50	51.3
ST4	10:00 – 10:20	54.5

Measurements taken on March 31, 2004

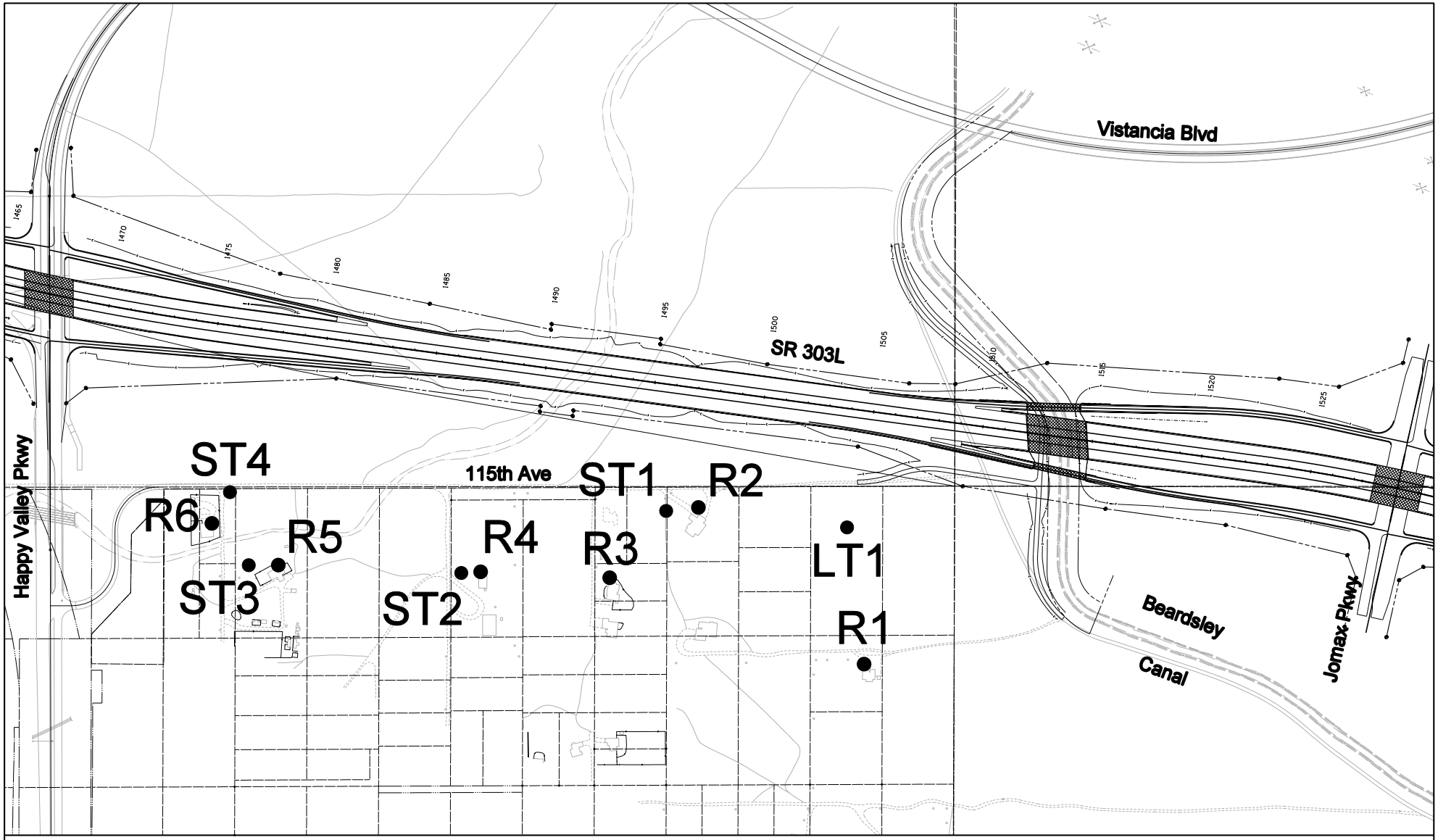
Table 4-4 Long-Term Sound Level Measurements at Location LT1 (dBA)		
Time Start	**Time Stop**	**L_{eq}**
15:00	16:00	44.2
16:00	17:00	50.6
17:00	18:00	53.1
18:00	19:00	46.2
19:00	20:00	44.6
20:00	21:00	46.7
21:00	22:00	46.7
22:00	23:00	47.4
23:00	0:00	46.1
0:00	01:00	45.7
01:00	02:00	46.7
02:00	03:00	49.6
03:00	04:00	49.4
04:00	05:00	51.6
05:00	06:00	54.9
06:00	07:00	56.4
07:00	08:00	55.4
08:00	09:00	51.3
09:00	10:00	53.3
10:00	11:00	54.5
11:00	12:00	55.5
12:00	13:00	64.4
13:00	14:00	52.2
14:00	15:00	53.4
15:00	16:00	72.1

Measurements taken on March 30 and 31, 2004

4.6.2 Impacts and Mitigation

No-Build Alternative

If the No-Build Alternative is selected, the proposed project and its associated interchanges would not be built. The interim expressway between US 60 and Happy Valley Parkway would remain. Future development of the area is expected to continue and some arterial roads likely would be extended or developed to support this development. Noise is expected to increase in the general area due to the future development in the area.



LEGEND:

- ST - Short Term Monitoring Location
- LT - Long Term Monitoring Location
- R - Modeled Receptor Location

N

0 500 1000

SCALE IN FEET

Noise Monitor and Receptor Locations
Estrella Freeway (SR 303L),
Happy Valley Road to 43rd Avenue
Project No. S 303-A-200
Tracs No. 303L MA 003 H5946 01L

Figure 4-5

ADOT

Proposed Project

STAMINA 2.0 Traffic Noise Prediction Model (based on FHWA RD-77-108) with FHWA 1974 Reference Energy Mean Emissions Levels was used to calculate future traffic noise levels at the closest residences along Segment 1. The modeling effort considered roadway alignments, estimated average vehicle speed, peak-hour traffic volume, vehicle mix, and the insertion loss afforded by the jersey barriers along the edges of the roadway (32 inches high) and along the center of the roadway (42 inches high). The model could not be calibrated because the planned roadway does not currently exist.

Traffic Data Assumptions

The model analyzes the peak-noise-hour condition, which generally occurs during the period when the peak-hour traffic volume is flowing freely. This condition is known as Level of Service (LOS) C. Typically, traffic volumes in excess of LOS C (i.e., LOS D) are associated with congestion and lower travel speeds, resulting in lower noise levels. Traffic speeds used for peak-noise-hour modeling of the travel lanes were 70 mph for the travel lanes and 45 mph for the off-ramps and on-ramps. Assumptions about the vehicle mix (the percentages of autos and light-duty trucks, medium-duty trucks, and heavy-duty trucks) are important because these parameters affect the resultant predicted noise levels. The STAMINA model assumes that heavy-duty trucks have louder noise levels and higher acoustic heights than autos, light-duty trucks, and medium-duty trucks. The vehicle mix used in the model was 90 percent autos and light-duty trucks, 8 percent medium-duty trucks, and 2 percent heavy-duty trucks.

The peak-hour traffic volumes used for this analysis were obtained from the traffic report (URS 2005a). However, the LOS C traffic volume of 6,080 vehicles in each direction was used to model the northbound and southbound lane. The AM peak-hour volumes were used to model the off-ramps and on-ramps because LOS C volumes are not known for the ramps. The AM peak-hour traffic volumes were used in the analysis because this period has a heavier traffic volume on the northbound side of the freeway, which is closer to the residences.

Noise Impacts

Per state and federal guidelines, noise abatement must be considered when the existing or predicted future peak-noise-hour from highway traffic approaches, equals, or exceeds the Noise Abatement Criteria (NAC) developed by FHWA in accordance with 23 CFR 772. The NAC serve as the upper limit of acceptable traffic noise levels for various types of land use, and are

defined for five different activity categories described in Table 4-5. A traffic noise impact occurs when either of the following conditions occurs:

- The predicted traffic noise level approaches or exceeds the NAC. ADOT defines "approaches" the NAC as being 3 dBA below the appropriate NAC. For example, NAC Land Use Category B impacts occur when the future $L_{eq}(h)$ value is 64 dBA or greater.

- The predicted traffic noise level substantially exceeds the existing noise level. ADOT defines "substantial" in this context as 15 dBA or greater.

Potential noise impacts were evaluated for the six closest residences along Segment 1 and correspond to receiver locations R1 through R6 as shown on Figure 4-5. Residences in the same area but farther away from the freeway were not evaluated, as noise levels at the more distant residences would be lower than at the evaluated residences. The evaluated residences would be located approximately 570 to 1,150 feet east of the centerline of the freeway and 470 to 1,050 feet east of the eastern pavement edge of the freeway, and 6 to 39 feet below the adjacent freeway grade.

Table 4-5
Federal and Arizona Noise Abatement Criteria

Activity Category	Hourly A-Weighted Sound Level (dBA $L_{eq}(h)$)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B*	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above
D	—	Undeveloped lands
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

Source: Federal Highway Administration 1982
*ADOT also includes places of worship and cemeteries under Category B.

Predicted noise levels with implementation of the proposed project are presented in Table 4-6. Unmitigated future peak-noise-hour levels at residences near Segment 1 are estimated to range from 64 to 69 dBA $L_{eq}(h)$. These sound levels would be 6 to 13 dBA $L_{eq}(h)$ above the existing ambient noise levels at these residences. The sound level at one of the six modeled receivers (R2) would exceed the FHWA 67 dBA $L_{eq}(h)$ NAC as a result of the proposed project. The

sound level at the remaining five modeled receivers would equal or exceed the ADOT 64 dBA $L_{eq}(h)$ "approach" criteria as a result of the proposed project.

Over the long term, it is anticipated that ambient noise levels will increase as development occurs. Additional receptors may be located in the area of the proposed project after this EA is approved. In accordance with Highway Traffic Noise Analysis and Abatement Policy and Guidelines issued by FHWA (June 1995), federal and state governments are no longer responsible for providing noise abatement for new development that occurs adjacent to a proposed highway project after the "date of public knowledge." The date of public knowledge represents the date that the public is officially notified of the adoption of the location for a proposed highway, and is determined by the state. The date of public knowledge cannot precede the date of approval of the Finding of No Significant Impact or Record of Decision. In addition, jurisdictions with the authority to regulate land use within the project area have been working with ADOT throughout the siting and study process.

Table 4-6
Predicted Traffic Noise Levels

Receiver Location	Existing Measured Sound Level (dBA L_{eq}(20 min))	Unmitigated Future Peak Sound Level (dBA $L_{eq}(h)$)	Sound Level Increase (dBA $L_{eq}(h)$)**	Noise Activity Category	Noise Abatement Criterion (dBA $L_{eq}(h)$)***
R1	58.1*	64	+6	B	64/67
R2	58.1	69	+11	B	64/67
R3	58.1*	65	+7	B	64/67
R4	56.9	65	+8	B	64/67
R5	51.3	64	+13	B	64/67
R6	54.5	65	+10	B	64/67

SOURCE: STAMINA 2.0 traffic noise prediction model run output

*Ambient measurements were not conducted at R1 or R3; the measurement taken at R2 was considered to be representative.

**The sound level increase/decrease was calculated based on the existing measured ambient level.

***64 dBA $L_{eq}(h)$ is the "approach" criterion; 67 dBA $L_{eq}(h)$ is the NAC.

Mitigation

A 19-foot high and 2,500-foot-long (Station 1485+00 to Station 1510+00) noise barrier would be required to reduce traffic noise by at least 5 dBA and to a level of 63 dBA $L_{eq}(h)$ or less at each impacted receiver. The estimated construction cost of the wall would be $1.67 million at a cost of $278,333 per benefited receiver. Since the cost per benefited receiver would exceed $35,000, the barrier is considered economically unreasonable per ADOT criteria and would not be

constructed. During final design or when the final environmental clearance is prepared, noise will be reexamined to determine whether new receptors are located in the project area or if additional studies are required.

According to the ADOT *Standard Specifications for Road and Bridge Construction*, (2000 Edition), Section 104, "Scope of Work," Subsection 08, "Prevention of Air and Noise Pollution," "[t]he contractor would comply with all local sound control and noise level rules, regulations and ordinances which apply to any work performed pursuant to the contract. Each internal combustion engine used for any purpose on the work or related to the work would be equipped with a muffler of a type recommended by the manufacturer."

4.6.3 Conclusion

The sound levels at the six modeled receivers would approach or exceed the ADOT/FHWA NAC (67 dBA L_{eq}) as a result of the proposed project. Mitigation by use of a noise barrier would reduce traffic noise by at least 5 dBA. However, the cost per benefited receiver would exceed $35,000, and therefore the barrier is considered economically unreasonable and would not be constructed.

4.7 HAZARDOUS MATERIALS

4.7.1 Existing Conditions

Hazardous materials considerations were addressed for the proposed project in a study area of approximately one-half mile from the proposed project centerline in any direction. The study area, located within the Salt River Valley, is a broad alluvial basin within the Basin and Range physiographic province. The basin is almost completely surrounded by mountains composed primarily of granitic, metamorphic, and volcanic rocks and minor amounts of consolidated sedimentary rocks. The valley floor is underlain by unconsolidated to semiconsolidated basin-fill sediments. In the eastern part of the Salt River Valley area, sedimentary deposits form the main water-bearing units and consist mainly of unconsolidated and weakly consolidated clay, silt, sand, and gravel. The main water-bearing unit ranges in thickness from a few tens of feet near the mountains to more than 1,200 feet in the central part of the area (Cooley 1973).

According to the United States Geological Survey Biscuit Flat, Arizona, 1965 (photorevised 1981) and Union Hills, Arizona, 1964 (photorevised 1981) 7.5-minute topographic quadrangle maps, the elevation of the study area ranges from approximately 1,500 to 1,700 feet above mean sea level.

The depth to groundwater in the area of the study area ranges from approximately 200 to 300 feet (Hammett and Herther 1992). The general direction of groundwater flow in the vicinity of the study area appears to be to the southeast.

Regulatory Database Review

A Preliminary Initial Site Assessment was conducted for each segment of the proposed project. In addition, information was gathered and reviewed from several environmental databases through Environmental Data Resources, Inc. (EDR 2003), to evaluate whether activities on or near the study area have the potential to create an environmental concern. EDR reviews databases compiled by federal, state, and local governmental agencies.

It should be noted that this information is reported as it is received from EDR, which, in turn, reports information as it is provided in various government databases. It is not possible to verify the accuracy or completeness of information contained in these databases. However, the use of and reliance on this information is a generally accepted practice in the conduct of environmental due diligence. EPA and ADEQ documents and lists were reviewed. Areas of potential concern that were identified are illustrated in Figure 4-6.

According to EDR, one Resource Conservation and Recover Information System – Small Quantity Generator with no violations, New West Material Sun City (11495 West Hatfield Road), is located within the study area along Segment 1. Based on the information given, this facility does not present an environmental concern to Segment 1. No additional sites were noted within the boundaries of Segment 1.

No properties within Segment 2 were identified in any of the databases reviewed. In addition, none of the unmapped sites were determined to be within the boundaries of this study area. No additional sites were noted within the Segment 2 boundaries.

One site within Segment 4 was listed by EDR. The Turf Soaring School Recreational Vehicle Park, a wastewater treatment facility, is located at the address of 8700 West Carefree Highway. Based on information presented by EDR, this facility does not present an environmental concern to Segment 4. No unmapped sites were noted within the boundaries around Segment 4.

4.7.2 Impacts and Mitigation

No-Build Alternative

If the No-Build Alternative is selected, the proposed project and its associated interchanges would not be built. Future development of the area is expected to continue and arterial roads are expected to be improved and built to support this development.

Future development in the area has the potential to impact hazardous material sites if sites are located in the areas to be developed. No observed or suspected concerns or unusual conditions were found within the study area.

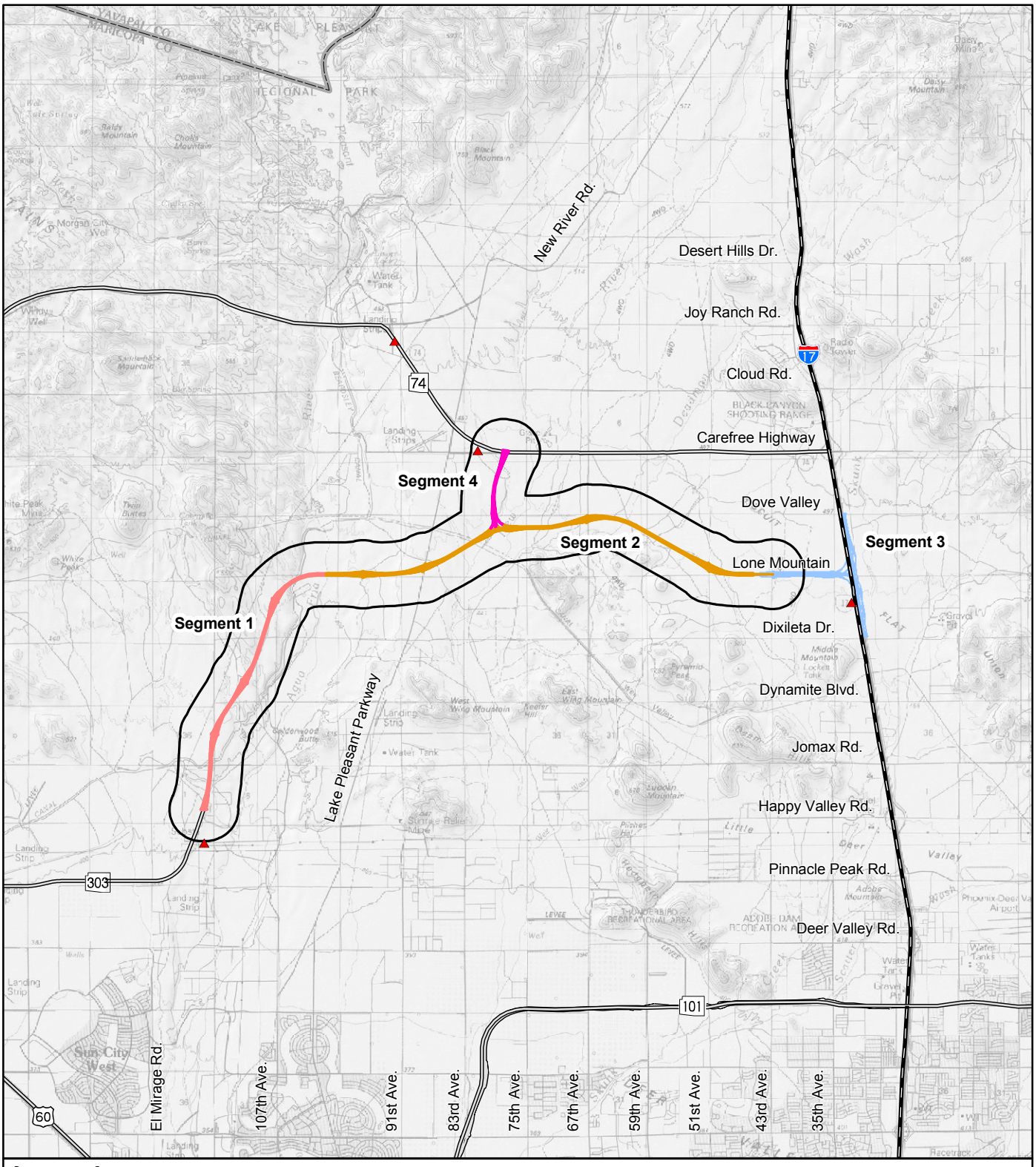
Proposed Project

Based on the information presented above, no observed or suspected concerns or unusual conditions were found and no specific mitigation is required. This assessment would be updated within six months of initiation of construction because the information summarized above is subject to change.

If construction activities include the modification or demolition of any structures (including concrete structures such as culverts, pipes, overpasses, etc.), a hazardous material survey would be required prior to demolition activities. If suspected hazardous material is encountered during construction, work would cease at that location and the ADOT Engineer would arrange for proper assessment, treatment, or disposal of those materials.

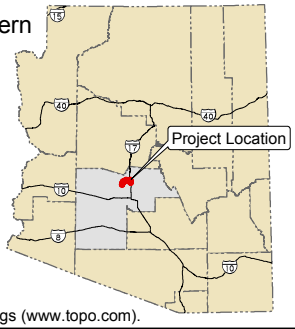
All discarded waste (including but not limited to human waste, trash, debris, oil drums, fuel, ashes, equipment, concrete, and chemicals) generated during construction activities would be removed and/or disposed of according to federal and state regulations.

According to ADOT's *Standard Specifications for Road and Bridge Construction*, (2000 Edition), Section 107, "Legal Relations and Responsibility to Public," Subsection 07, "Sanitary, Health, and Safety Provisions," should the contractor encounter potential hazardous or contaminated material, the contractor would immediately stop work and remove workers, barricade the area, provide traffic controls and notify the ADOT Engineer. The ADOT Engineer would arrange for proper assessment, treatment, or disposal of those materials. Such locations would be investigated and proper action implemented prior to the continuation of work in that location.



Legend

- Potential Hazardous Material Concern
- Study Boundary
- County Line
- Study Segment 1
- Study Segment 2
- Study Segment 3
- Study Segment 4
- Interstate/Highway
- State Route



Source:
-Arizona Land Resource Information System, 1997.
-Map created with TOPO!(tm) (c)2002 National Geographic Holdings (www.topo.com).

Potential Hazardous Material Location
Estrella Freeway (SR 303L), Happy Valley Road to 43rd Avenue

Project No. S 303-A-200
Tracs No. 303L MA 003 H5946 01L
Figure 4-6

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4.7.3 Conclusions

No adverse impacts related to hazardous material are expected as a result of the proposed project. Updated initial site assessments would be obtained during final design if right-of-way is required from, or excavation is anticipated on or adjacent to, any properties identified with potential hazardous material contamination. During Phase IV of the final design, the ADOT project manager would contact ADOT's Environmental Planning Group hazardous material coordinator (602-712-7768) to determine the need for additional site assessment. Based on American Society of Testing Materials standards, the hazardous material assessment data can be relied upon for a maximum of 180 days from the completion of the assessment.

4.8 CULTURAL RESOURCES

4.8.1 Existing Conditions

Description of Cultural Resources

Cultural resource inventory at this stage of planning was based primarily on review of prior studies (Cox and Rogge 2003). A limited sample survey was conducted to fill in major gaps in the coverage of prior surveys along Segment 2 and Segment 4 (Cox and Rogge 2004).

A records review identified 14 archaeological and historical resources that had been previously recorded and mapped within 300 feet of either side of the proposed project centerline (Table 4-7). The sample field survey identified two additional archaeological sites along the proposed project—one along Segment 2 and one along Segment 4.

Essentially all of the recorded resources are archaeological sites that reflect occupation of the region by the prehistoric Hohokam culture from approximately A.D. 1 to 1500, or perhaps the earlier Archaic era. Three of these sites are within the New River Dam Archaeological District, which was investigated in the 1970s and early 1980s during the planning of the New River Dam, a flood control structure built by the Corps. Most of the archaeological sites recorded along the preferred alignment are artifact scatters. Some of the artifact scatters have various types of rock features that may reflect upland farming based on manipulating rainfall runoff or other undetermined uses. Other artifact scatters are debris from the flaking of local rocks to make stone tools. Some of the sites may have remnants of seasonally occupied camps or field houses, but only one site represents a more complex village. Data recovery studies were previously conducted at that village site to mitigate impacts of the New River Dam.

One possible historic site may be the foundation of a simple one-room rock building. The other historic site is the Beardsley Canal. Construction of this canal began in the 1890s, but was not completed and put into service until the 1920s. The canal has been upgraded and remains in use.

The prior surveys, which have been conducted over the past three decades, provide considerable information about the region traversed by the proposed project. Not all of these surveys may be considered adequate by current standards, but in aggregate they represent more than 40 percent coverage of the right-of-way for the preferred alignment (approximately 440 acres of an estimated 1,000 acres of new right-of-way). The available data indicate that the potential is low for discovering large, complex Hohokam village sites along the preferred alignment, but numerous other archaeological sites could be found during subsequent intensive survey.

Table 4-7
Summary of Cultural Resources within the Area of Potential Effect

	Site Number/ Name	Affiliation and Age	Site Type	National Register Eligibility Status
Segment 1 (approximately 40 percent previously surveyed)				
1	AZ T:3:55(ASM) Beardsley Canal	Euro-American post-1890s	historic irrigation canal	determined eligible by SHPO, Criterion A
2	AZ T:3:145(ASM)	Hohokam, undated	artifact scatter	recommended ineligible
3	AZ T:3:165(ASM)	Hohokam	artifact scatter with 200 rock agricultural and habitation rock alignments	recommended eligible, Criterion D
4	AZ T:3:166(ASM)	Hohokam	artifact scatter with a rock alignment	recommended eligible, Criterion D
5	AZ T:3:169(ASM)[1]	Hohokam	artifact scatter with 3 rock alignments	recommended eligible, Criterion D
6	AZ T:3:171(ASM)	Hohokam	artifact scatter	recommended eligible, Criterion D
7	AZ T:3:172(ASM)	Hohokam	artifact scatter with 6 rock alignments	recommended eligible, Criterion D
8	AZ T:3:178(ASM)	Hohokam	artifact scatter with rock alignment	recommended ineligible
9	AZ T:4:16(ASM)[1] Antelope Glyph Site	Hohokam	village	data recovery studies conducted
10	AZ T:4:45(ASU)[1]	Hohokam, undated	artifact scatter	recommended ineligible
11	AZ T:4:46(ASU)[1]	Hohokam, undated	artifact scatter with canal, fields, possible fire pit	recommended ineligible
12	AZ T:7:145(ASM)	Hohokam, AD 200-1500	artifact scatter with rock cluster, flaked stone knapping site	recommended ineligible

Table 4-7 Summary of Cultural Resources within the Area of Potential Effect				
	Site Number/ Name	**Affiliation and Age**	**Site Type**	**National Register Eligibility Status**
13	AZ T:7:147(ASM)	aboriginal, undated	flaked stone scatter	recommended eligible, Criterion D
14	AZ T:7:151(ASM)	historic	one-room structure	testing recommended
Segment 2 (approximately 50 percent previously surveyed)				
15	AZ T:4:378(ASM)	aboriginal, undated	flaked stone scatter	recommended eligible until tested, Criterion D
Segment 4 (approximately 35 percent previously surveyed)				
16	AZ T:4:382(ASM)	Hohokam	artifact scatter	recommended eligible until tested, Criterion D

[1] located within the New River Dam Archaeological District

Simple projection from the extent of prior coverage suggests that as many as 20 to 25 more sites might be discovered. Intensive survey would be initiated to complete the inventory of cultural resources as designs for the roadway become more refined and the area of potential effect can be defined with more precision.

National Register Eligibility

Criteria for listing on the Arizona Register of Historic Places and the National Register of Historic Places (Registers) are essentially identical. Those criteria are used to evaluate the significance of cultural resources.

During reviews of prior projects, the SHPO has concluded that the Beardsley Canal is eligible for the Registers. The basis for the determination of eligibility is not well documented, but the canal apparently is considered eligible under Criterion A because of its association with the history of agricultural development in the Phoenix Basin. The historic integrity of all segments of the canal is not well documented, and some parts of the in-use canal may no longer retain historic characteristics.

Five of the 16 other archaeological sites identified were recommended ineligible for listing on both Registers, but no documentation of formal SHPO review of those evaluations has been identified. The other sites may be eligible for the Registers because of their potential to yield important information (Criterion D), but they remain to be formally evaluated. Archaeological surveys would be necessary to determine their current condition, and archaeological testing may be needed to evaluate their Register eligibility.

Once the cultural resource inventory is completed, ADOT will evaluate all resources within the area of potential effect for their Register eligibility. A projection based on the available data suggests that approximately 70 percent of the recorded sites and the additional sites that might be discovered by subsequent intensive survey are likely to be eligible for the Registers. ADOT will make those evaluations in consultation with the SHPO.

4.8.2 Impacts

No-Build Alternative

If the No-Build Alternative is selected, the proposed project and its associated interchanges would not be built. Future development of the area is expected to continue and arterial roads are expected to be improved and built to support this development. Any development undertaken by another federal or state entity would be subject to the same regulation by SHPO; private development activities may result in adverse impacts to cultural resources that have been identified in the study area. Given the lack of specific development plans at this time, it is difficult to assess the nature of potential effects.

Proposed Project

Because of the preliminary phase of design, the area of potential effect is not well defined at this time. All of the resources listed in Table 4-7 could be affected by construction of the proposed project. Sixteen archaeological and historical sites have been recorded along the preferred alignment but their current condition is not well documented, and their Register eligibility has not been formally evaluated. Some of the resources may lack significant historic values that would make them Register-eligible, and their destruction would not be considered an adverse effect. However, the proposed project would cross the Beardsley Canal twice and it is considered Register-eligible, although the historic integrity of the canal at the crossings remains to be documented. Some of the other recorded resources or any resources discovered by subsequent intensive survey will probably be determined to be eligible for the Register, and it is unlikely that all of them could be avoided. Therefore, the available data suggest that approximately 25 to 30 Register-eligible archaeological sites are likely to be adversely affected by the construction of the proposed project.

4.8.3 Mitigation

As project planning continues, ADOT would work to avoid or reduce substantial alteration or demolition of Register-eligible properties in compliance with the State Historic Preservation Act. If impacts cannot be avoided, ADOT would mitigate those impacts by compiling and preserving appropriate documentation through archaeological and historical studies in accordance with

SHPO standards. According to ADOT's *Standard Specifications for Road and Bridge Construction*, (2000 Edition), Section 107, "Legal Relations and Responsibility to Public," Subsection 05, "Archaeological Features," "[w]hen previously unidentified archaeological, historical, or paleontological features are encountered or discovered during any activity related to the construction of the project, the contractor would stop work immediately at that location and would take all reasonable steps to secure the preservation of those resources and notify the Engineer." The ADOT Engineer would, in turn, notify ADOT's Environmental Planning Group Historic Preservation Team (602-712-8636) to evaluate the significance of the resources.

ADOT is developing a Programmatic Agreement with SHPO and other appropriate parties to stipulate how cultural resources will continue to be considered in compliance with the State Historic Preservation Act and the Arizona Antiquities Act as planning of SR 303L proceeds.

4.8.4 Conclusion

ADOT is developing and will execute a Programmatic Agreement with the SHPO and other appropriate parties to stipulate how cultural resources will continue to be considered to avoid or reduce adverse impacts as project planning continues. Consideration of cultural resources will entail additional intensive inventory surveys, archaeological testing to evaluate significance (as appropriate), and compilation and preservation of documentation through archaeological and historical studies to mitigate unavoidable alterations or demolition of Register-eligible resources. Procedures for dealing with any unexpected discoveries during construction also will be defined. Such measures are considered acceptable mitigation.

4.9 SOCIOECONOMIC RESOURCES

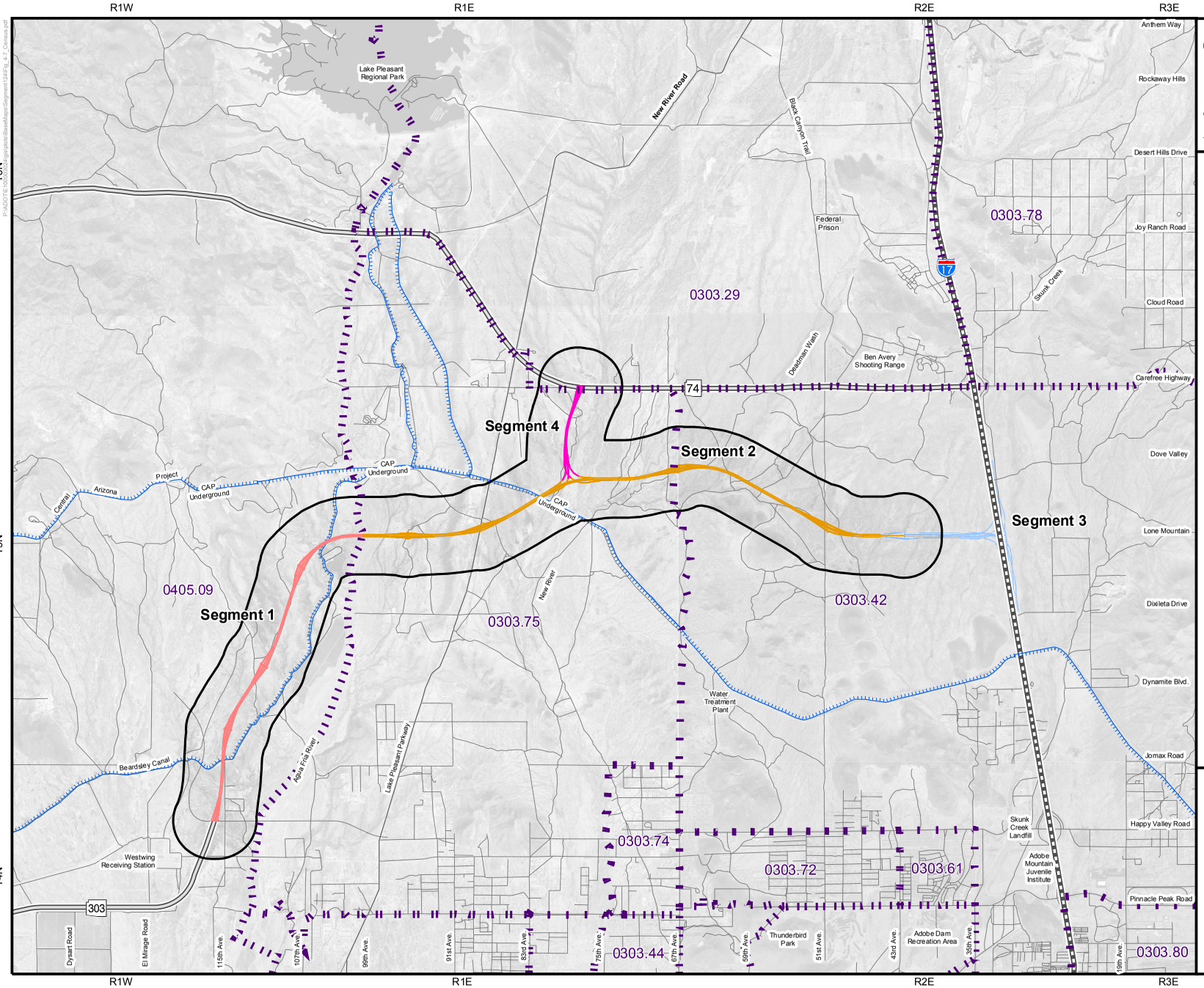
4.9.1 Demographics

Demographic data obtained from the U.S. Bureau of the Census were used to compare the demographic profile of the study area to that of Maricopa County, Peoria, Phoenix, and Glendale (Table 4-8). Five census tracts represent the population within the study area, and are illustrated in Figure 4-7. Census tracts represent small statistical subdivisions of a county. The area described by these statistical units extends outside the study area. Therefore, the exact population and demographic characteristics of the study area (the area within one-half mile of the proposed project centerline) may vary from these data.

Table 4-8
Census Tract Characterization

Demographic Characteristic	Census Tract 303.29	Census Tract 303.42[1]	Census Tract 303.75[1]	Census Tract 303.78[1]	Census Tract 405.09		City of Peoria	City of Phoenix	City of Glendale	City of Surprise	Maricopa County
Total Population	3,744	8,786	2,289	5,247	15,675		108,364	1,321,045	218,812	30,848	3,072,149
Gender:											
Male	60.8%	53.8%	51.4%	50.6%	49.2%		48.0%	50.9%	49.9%	49.1%	50.0%
Female	39.2%	46.2%	48.6%	49.4%	50.8%		52.0%	49.1%	50.1%	50.9%	50.0%
Race and ethnicity:											
White alone	86.6%	87.7%	94.6%	86.4%	88.2%		84.9%	71.1%	75.5%	86.0%	77.4%
Black or African-American alone	8.2%	2.6%	0.7%	.6%	0.7%		2.8%	5.1%	4.7%	2.6%	3.7%
American Indian/ Alaska Native alone	2.8%	1.4%	0.8%	.7%	0.8%		0.7%	2.0%	1.5%	0.4%	1.8%
Asian alone	1.0%	1.6%	0.9%	.5%	0.4%		1.9%	2.0%	2.7%	1.1%	2.2%
Some Other Race alone[3]	0.3%	4.4%	1.5%	1.4%	8.3%		7.2%	16.5%	12.1%	8.0%	12.0%
Two or More Races alone	1.1%	2.2%	1.5%	1.1%	1.6%		2.5%	3.3%	3.5%	2.0%	2.9%
Hispanic or Latino	13.0%	14.5%	6.0%	4.5%	15.8%		15.4%	34.1%	24.8%	23.3%	24.8%
Age 60 years and over	20.4%	6.4%	7.8%	6.0%	45.2%		18.1%	10.9%	10.4%	34.2%	15.1%
Individuals below poverty level[4]	3.8%	7.0%	4.4%	4.9%	9.0%		4.7%	12.4%	10.3%	6.1%	9.7%
Median household income	$45,024	$55,864	$81,976	$65,919	$39,254		$52,199	$41,207	$45,015	$44,156	$45,358

Source: U.S. Bureau of the Census 2000.
[1]Nearest population in the census tract is located approximately 1 mile or more from the preferred alignment.
[2]Includes data collected for all five affected census tracts.
[3]Includes Native Hawaiian and Other Pacific Islander.
[4]Among civilian non-institutionalized persons 16 years of age and over.
[5]Represents average median income reported for all affected census tracts.
Percentages may not total 100 due to rounding.



Census Tracts

Estrella Freeway (SR 303L), Happy Valley Road to 43rd Avenue

Project No. S 303-A-200
Tracs No. 303L MA 003 H5946 01L

Legend

- Study Boundary
- Study Segment 1
- Study Segment 2
- Study Segment 3
- Study Segment 4
- Interstate/Highway
- State Routes
- Roads
- Canals

2002 Census Tracts

- 0032 Census Tracts with Tract Number

Source:
-Maricopa County, Arizona. Zoning Ordinance, 1993.
-USDI Bureau of Land Management. Proposed Resource Management Plan and Final Environmental Impact Statement, December 1988.
-ESRI Data and Maps Media Kit, 2002.
-Aerial Imagery: Kenny Aerial Mapping, Inc., 1999, 2000.

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ADOT

Figure 4-7

The demographic data suggest several patterns. For example, the study area has a higher percentage of white residents and lower percentages of non-whites and persons classified as Hispanic or Latino than Maricopa County or any of the cities. When evaluated individually, some of the affected census tracts demonstrate higher percentages of persons classified as minority populations when compared to the county as a whole. Specifically, census tract 303.29 has a higher proportion of Black or African-American and American Indian/Alaska Native residents than each city and Maricopa County as a whole. Census tract 405.09 has a substantially larger proportion of persons over age 60 and a lower median household income than each surrounding city and Maricopa County. This is likely attributable to that portion of Sun City West located within this particular census tract. Sun City West is located approximately 3 miles from the proposed project, and thus would not be directly affected by the implementation of the proposed project. Census tract 303.29 also includes a relatively large proportion of residents over 60 years of age. Census tract 303.75 may be characterized as a predominantly white tract (94.6 percent) with a median household income considerably higher than that in Maricopa County or the surrounding cities.

MAG forecasts a population of 6.3 million in Maricopa County in 2030. The project area is expected to grow to 1.86 million, or 31 percent of the projected regional total, by that time. (MAG 2003c).

4.9.2 Title VI/Environmental Justice

Title VI of the Civil Rights Act of 1964 and related statutes assure that individuals are not excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance on the basis of race, color, national origin, age, sex, and disability. Executive Order 12898 on Environmental Justice directs that programs, policies, and activities not have a disproportionately high and adverse human health and environmental effect on minority and low-income populations. According to these regulations:

- Minority populations are persons of Hispanic or Latino origin of any race; Blacks; American Indian/Alaska Natives; and Asians or Pacific Islanders Low-income populations are persons living below the poverty level. The U.S. Census Bureau uses a set of income thresholds that vary by family size and composition to determine who is poor.

To evaluate whether these populations exist disproportionately within the study area, census-tract level data for the tracts that include the project study area (the area within a one-half mile of the

proposed project) were compared with the larger population. A disproportionately high minority or low-income population occurs if the percentage of the population fitting these descriptions (1) exceeds 50 percent, or (2) exceeds the Maricopa County ratio. Data for municipalities in the vicinity of the proposed project also are included to provide additional context. As shown in Table 4-8, the proportions of the population that are defined as minority or low-income within the project area census tracts generally are comparable to or lower than the proportion within the overall population in the County or local jurisdictions. An exception is the higher percentage of Black or African-Americans within the population in tract 303.29 (8.2 percent) compared to the City of Phoenix (5.1 percent) or Maricopa County (3.7 percent). This tract is located north of SR 74, and no existing residences or businesses are located within the small portion of this tract that is within the study area.

To further evaluate the potential presence of minority populations, an analysis was conducted to aggregate the racial and ethnic minorities together to determine whether a disproportionate overall minority population exists in the study area. Within the census data, ethnicity (whether or not a person is Hispanic) is considered separately from race. Table 4-9 shows the total minority populations within the study area, including both ethnicity and race while ensuring that double-counting has not occurred (i.e., ensuring that a person who indicated that he or she is both African-American and Hispanic is only included once). The data indicate that minority populations within the project area do not occur disproportionately when compared to the County overall.

The percentage of individuals below the poverty level in each census tract and comparison population is presented in Table 4-8. The data indicate that the proportion of the population that is low-income is lower throughout the study area than the Maricopa County figure of 9.7 percent.

Table 4-9
Minority Populations in the Study Area

Geographic Area	Minority Population	Percentage of Overall Population
Census Tract 303.29	965	25.8%
Census Tract 303.42	1,824	20.8%
Census Tract 303.75	216	9.4%
Census Tract 303.78	418	8.0%
Census Tract 405.09	2,904	18.5%
City of Peoria	23,994	22.1%
City of Phoenix	584,201	44.2%
City of Glendale	77,350	35.3%
City of Surprise	8,712	28.2%
Maricopa County	1,037,619	33.8%

Source: U.S. Bureau of the Census 2000.

4.9.3 Emergency Services – Police, Fire, Ambulance, Hospital

Various jurisdictions are located within the project vicinity; therefore, the following emergency response departments serve the surrounding existing development:

- City of Glendale Police Department Foothills Station (intersection of Deer Valley Road and 57th Avenue)
- City of Glendale Fire Department (intersection of Deer Valley Road and 57th Avenue)
- City of Peoria Fire Administration (intersection of Lake Pleasant Parkway and Pinnacle Peak Road)
- City of Peoria Police (intersection of Lake Pleasant Parkway and Pinnacle Peak Road)
- City of Surprise Fire Department (intersection of 163rd Avenue and US 60)
- City of Surprise Police Department (intersection of Bell Road and El Mirage Road)
- City of Phoenix Fire Department (5230 West Happy Valley Road)
- City of Phoenix Police Department (6255 West Union Hills Drive)
- Rural Metro Fire Department (intersection of Indian School Road and Granite Reef)
- Maricopa County Sheriff Department (intersection of Dysart Road and Bell Road)
- Department of Public Safety (intersection of 111th Avenue and Peoria Avenue)

Two hospitals are within approximately 2 miles of the proposed project. Arrowhead Community Hospital is southeast of the study area near the intersection of 67th Avenue and Union Hills Drive and John C. Lincoln Hospital is near the I-17 and Loop SR 101 interchange southwest of the study area. and John C. Lincoln Hospital is near the I-17 and Loop SR 101 interchange southwest of the study area.

4.9.4 Social Services, Schools, Recreation

The study area includes the Peoria Unified School District #11 and Deer Valley Unified School District #97. There are several educational facilities located throughout the overall project region; however, the closest school is located more than 3 miles distant from the preferred alignment. More specifically, the Anthem Elementary School is located approximately 1 mile east of I-17 and about 1 mile north of Desert Hills Drive.

There are several designated recreational areas within the overall project region, including the Lake Pleasant Regional Park, Thunderbird Park, and Adobe Dam Recreation Area; none of these

areas would be impacted by the preferred alignment. Finally, the Ben Avery Shooting Range is located immediately north of SR 74 and west of I-17; access to this facility is provided from SR 74.

4.9.5 Impacts and Mitigation

No-Build Alternative

The No-Build Alternative would impact the area's economic potential by reducing access to planned commercial areas and residential neighborhoods, and likely would not comply with planned and adopted development plans within the study area. These impacts would occur on a regional basis, and therefore would not be borne disproportionately by any particular racial, age, or income group.

Proposed Project

Neighborhood Continuity

The study area consists primarily of undeveloped land. Interspersed residential developments have been identified within the vicinity of the preferred alignment, generally at the southeast quadrant of the intersection of the Jomax Road and Happy Valley Road alignments and also near the intersection of I-17 and New River Road. However, the proposed project would not divide any established residential areas. Rather, the proposed project would provide needed access to regional shopping, educational, recreational, and other community services. As a result, it is expected that the proposed project would have a relatively minor impact, if any, on neighborhood continuity.

Title VI/Environmental Justice

Based on the best available data, the project area is not characterized as having an uneven distribution or disproportionate ratio of minority or low-income populations. The proposed project is not anticipated to have adverse effects on human health and the environment for the local population generally, and consequently would not result in disproportionately high and adverse impacts to any one group. Construction of the proposed project would benefit all segments of the traveling public in the study area and the overall region by improving mobility and reducing congestion on existing roadways.

Emergency Services and Social Services, Schools, Recreation

The proposed project would improve access to existing police, fire, ambulatory, or hospital services. It is expected that the proposed project would have a positive impact on access to educational facilities and recreational facilities within the region by providing an enhanced freeway system that would provide improved access to the project vicinity and also the northwest and southwest portions of the Phoenix metropolitan area.

Relocations/Displacements

No residential or commercial displacements or relocations would be required for construction of the proposed project.

Access

During project construction, traffic on existing roads through the area and access to adjacent properties would be maintained in accordance with ADOT traffic control management procedures for roadway construction and maintenance. It is expected that disruptions associated with construction would be minimal. Access to the Turf Soaring School and Pleasant Valley Airport and businesses located generally at the intersection of SR 74 and Lake Pleasant Parkway would be maintained throughout project construction.

Vehicular access and traffic patterns would be maintained in the residential area located east of the proposed project near the intersection of Happy Valley Road and El Mirage Road. Access also would be maintained at all times to APS' Westwing Receiving Station. ADOT would coordinate with the appropriate agencies to ensure continued access to and along the CAP and Beardsley Canals.

Two-way vehicular travel would be maintained along existing roadways (i.e., New River Road, Lake Pleasant Parkway, and SR 74). Traffic control would be implemented in accordance with Part VI of the *Manual on Uniform Traffic Control Devices for Streets and Highways*, published by the FHWA (1993), *Traffic Control Supplement* (1996), and/or associated provisions in the project plans, as determined by the ADOT Traffic Design Section during design.

In order to minimize temporary impacts associated with the preferred alignment, the ADOT District Construction office would provide notices of construction to adjacent residents and business owners at least two weeks prior to construction.

Business Disruption

There are no businesses located within the project area that would be disrupted by the implementation of the proposed project. At the intersection of the Beardsley Canal and the proposed project, a small portion of what appears to be a fallow orchard field would be removed, as the proposed project would be sited in this location.

4.9.6 Conclusion

No adverse socioeconomic effects would occur as a result of the proposed project, due to (1) the use of State Trust land for new right-of-way and subsequent avoidance of residential or commercial displacement or relocation, (2) the lack of adverse effects to human health and environment associated with the proposed project, and (3) minimal impacts associated with access or business disruption throughout construction. The implementation of the proposed project would benefit the current and projected population by improving circulation patterns and access in the area, as well as accommodating future traffic demand.

4.10 UTILITIES

4.10.1 Existing Conditions

The corridor area currently has little existing development, and few utilities exist inside the study area. However, a few major facilities pass through the preferred alignment. El Paso Natural Gas Company owns a 20-inch high-pressure natural gas line, which is a major trunk line that services the greater Phoenix area. The line runs generally west of and parallel to Lake Pleasant Parkway and New River Road. APS owns a 230 kV overhead transmission power line that runs along the western edge of the project corridor (Segment 1). Salt River Project (SRP) also owns a 230 kV transmission power line that crosses the corridor south of the south end of the project limits near Happy Valley Parkway.

Future Utilities

As this area continues to be developed, more utilities would be installed in the area. Future utilities would include fiber optic, water, sewer, gas, and power lines. Main trunk lines as well as distribution systems for each of these facilities would be necessary to service the developing communities.

APS has a planned 230 kV transmission line that would traverse along the north side of the Dove Valley Road section line and cross the preferred alignment south of Carefree Highway and again east of 43rd Avenue.

4.10.2 Impacts and Mitigation

To construct the planned freeway project, several major and minor utility relocations would be necessary. The alignment crosses the El Paso gas line west of Lake Pleasant Parkway. At Lake Pleasant Parkway, the freeway would be depressed under the cross street, so the gas line would need to be lowered to accommodate the freeway. Through discussion with El Paso Natural Gas Company staff, it is recommended that the pipeline be relocated to cross beneath SR 303L. The cost of this relocation is expected to be a project cost. The existing 230 kV transmission power lines are owned by APS and SRP but are not expected to be affected by the proposed project.

Due to the planned APS 230kV transmission line, the proposed interchange between Segments 2 and 4 would cause the future Dove Valley Road to be built one-quarter mile north of the section line. APS indicated that their alignment could also be moved northward to remain north of the future Dove Valley Road. Continued coordination with APS would be necessary in order to reduce or eliminate future conflicts.

Coordination with companies and the developers of the communities regarding future utilities development would be necessary to avoid future utility conflicts. ADOT's Utility and Railroad Engineering Section would investigate for potential utility conflicts during the project design phase.

4.10.3 Conclusion

Utility companies have participated in the study and design process for the proposed project, and their continued involvement would ensure that the proposed project would not adversely affect existing or future utilities in the project area.

4.11 MATERIAL SOURCES AND WASTE MATERIALS

The project area includes a large number of materials sources that could be used for facility construction. The proposed project would not require or designate a waste disposal site. It would be the responsibility of the construction contractor to identify any needed material sources and to provide the environmental documentation regarding use of these sites, as specified in Section 104.12 of ADOT's *Standard Specifications for Road and Bridge Construction* (2000 Edition).

According to ADOT's *Standard Specifications for Road and Bridge Construction* (2000 Edition), Section 1001, "Material Sources," Subsection 2, "General," any material sources

required for this project outside of the project area would be examined for environmental effects, by the contractor, prior to use, through a separate environmental analysis.

According to ADOT's *Standard Specifications for Road and Bridge Construction* (2000 Edition), Section 107, "Legal Relations and Responsibility to Public," Subsection 11, "Protection and Restoration of Property and Landscape," "[m]aterials removed during construction operations such as trees, stumps, building materials, irrigation and drainage structures, broken concrete, and other similar materials would not be dumped on either private or public property unless the contractor has obtained written permission from the owner or public agency with jurisdiction over the land. Written permission would not be required, however, when materials are disposed of at an operating, public dumping ground." The contractor would dispose of excess waste material and construction debris at a municipal landfill approved under Title D of the Resource Conservation and Recovery Act, construction debris landfill approved under Article 3 of the Arizona Revised Statutes 49-241 (Aquifer Protection Permit) administered by the ADEQ, an inert landfill, or at another approved site.

4.12 CONSTRUCTION WATER SOURCE

The contractor would be responsible for identifying which water source(s) would be used for construction activities. If an environmental clearance for construction water is needed, it would be addressed in a separate environmental document.

4.13 SECONDARY IMPACTS

Secondary impacts are defined broadly in the Council on Environmental Quality guidelines as "those impacts that are caused by an action and occur later in time, or are farther removed in distance but are still reasonably foreseeable after the action has been completed" (40 CFR 1508.8).

The construction of the proposed project would result in increased traffic volumes on SR 303L, and would alleviate congestion on I-17, particularly on weekends. Increased traffic may affect noise and air quality levels. However, air quality analyses indicate that the proposed project would remain in conformity with the State Implementation Plan. Changes in noise levels are expected to comprise a minor incremental effect in the project area. In addition, these improvements would accommodate continuing and planned development in the I-17 corridor and the northwestern portion of the Phoenix metropolitan area. Traffic would be generated by the anticipated residential, commercial, industrial, and municipal uses.

4.14 CUMULATIVE IMPACTS

Cumulative impacts are defined in 40 CFR 1508.7 as "the incremental impact(s) of the action when added to other past, present, and reasonably foreseeable future actions."

The key factor in evaluating cumulative effects for this project is the extensive projected growth and development of the project area. The Cities of Peoria and Phoenix are planning for high rates of residential and commercial development in the project area within 20 years.

Table 4-10, Cumulative Effects, provides a summary by key resource of the potential cumulative effects of past, present, and future actions in combination with the proposed project. Overall, the proposed project is expected to have a minor incremental effect when added to the anticipated growth and development in the area, which would contribute to major changes to most resources. Positive effects of the proposed project include the reduction of traffic congestion that would result from projected growth and development.

Table 4-10 Cumulative Effects					
Resource	**Past Actions**	**Present Actions**	**Proposed Action**	**Future Action**	**Cumulative Effect**
Cultural Resources	Development and road construction to date may have disturbed some cultural sites.	Ongoing development would require cultural survey that would identify additional sites, and sites may be disturbed due to development activity.	Construction of the proposed project would cross a Register-eligible resource (Beardsley Canal) and likely would affect resources that would be discovered by subsequent intensive survey. Mitigation measures would be implemented for existing and discovered resources.	Projected development would result in additional cultural survey, identification of sites, and disturbance of sites.	Extensive development of the project area would result in the survey and/or disturbance of cultural sites. The proposed project would result in incremental impacts on cultural resources, although it is not possible to quantify the additive or cumulative effect due to uncertainty as to the resources that may be discovered throughout the area.
Biological Resources	The construction of roads and utilities has fragmented the area, intersecting habitat and potential wildlife corridors.	Ongoing development would result in the loss of vegetation and habitat.	Construction of the proposed project would result in some loss of vegetation but overall minimal impacts to vegetation and habitat. Impacts to protected native plants would be mitigated in accordance with the ANPL.	Projected development would result in major loss of existing vegetation and habitat, and the displacement of wildlife.	The conversion of the project area into a more urban, developed environment would trigger the loss or degradation of vegetation and biodiversity. The proposed project would contribute a minor incremental effect on biological resources.
Air Quality	Unimproved roads and traffic on I-17 and local roads contribute some dust and emissions.	Ongoing development may accelerate emissions from traffic.	Construction of the proposed project would result in minimal, temporary impacts during construction, and overall the project would be in conformity with the State Implementation Plan.	Projected development would increase traffic and associated emissions, road construction, and introduce new sources that likely would degrade air quality.	Air quality would continue to be regulated in accordance with the State Implementation Plan. The proposed project is in compliance with the conformity rule.

Table 4-10 Cumulative Effects					
Resource	**Past Actions**	**Present Actions**	**Proposed Action**	**Future Action**	**Cumulative Effect**
Noise	Sources of noise include I-17, other arterial streets, overflights, and construction activities.	Ongoing development increases noise sources.	Based on noise modeling, it is anticipated that six receivers (residences within 1,150 feet of the proposed freeway centerline) would experience sound levels that exceed the NAC or the approach criteria. The construction of a noise barrier was evaluated, and it was concluded that the estimated cost of the barrier would exceed $35,000 per benefited receiver. Therefore, the barrier is considered economically unreasonable and would not be constructed.	Projected development would have increasingly additive effects on noise.	Ambient noise levels would increase as development occurs and I-17 is widened. This would have the effect of minimizing the overall effect of the noise contributed by the proposed project. New receivers likely would be added in the vicinity of the proposed project, but specific locations and the associated levels of sensitivity to noise cannot be identified with certainty at this time.
Land Use and Visual Resources	Some road and other development has occurred.	Ongoing development is occurring and proposed.	Construction of the proposed project would not have adverse impacts on land use or visual resources, due to low scenic quality and expected future development.	Projected development would result in major changes to the visual setting and land use as the area urbanizes.	Extensive development in the area would result in major changes to land use and the visual setting as the area urbanizes. The proposed project would probably have a synergistic effect with developing land uses, because it would increase access to the area; however, it would be needed to accommodate the projected traffic and the freeway is not considered a cause of projected development.

Table 4-10 Cumulative Effects					
Resource	**Past Actions**	**Present Actions**	**Proposed Action**	**Future Action**	**Cumulative Effect**
Water Resources	Road construction and other development (including dam construction and water impoundment) have resulted in impacts to jurisdictional waters and floodplains.	Ongoing development is expected to affect water resources and increase runoff due to impervious surfaces.	Construction of the proposed project would cross floodplains, and likely would cross juris-dictional waters. Potential impacts would be miti-gated through project design and use of best management practices.	Projected development would result in major changes to runoff, and would impact floodplains and jurisdictional waters.	Extensive development of the project area would result in the changes to water quality and natural floodplains. The proposed project would have a minimal incremental effect on water resources.